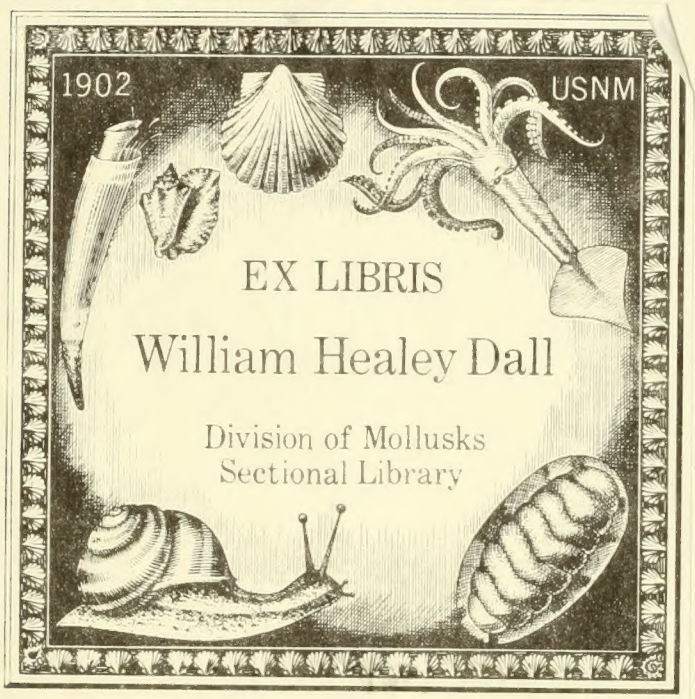
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164

Natural History

OF

NEW YORK.

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1843.

... history survey/

ZOOLOGY

OF

NEW-YORK,

OR THE

NEW-YORK FAUNA;

COMPRISING DETAILED DESCRIPTIONS OF ALL THE ANIMALS HITHERTO OBSERVED WITHIN THE STATE OF NEW-YORK; WITH BRIEF NOTICES OF THOSE OCCASIONALLY FOUND NEAR ITS BORDERS: AND ACCOMPANIED BY APPROPRIATE ILLUSTRATIONS.

BY JAMES E. DE KAY.

PART V. MOLLUSCA.

ALBANY:
CARROLL AND COOK, PRINTERS TO THE ASSEMBLY.

1843.

The copy-right of this work is secured for the benefit of the People of the State of New-York.

SAMUEL YOUNG,

Secretary of State.

Albany, 1843.

TO

WILLIAM C. BOUCK,

GOVERNOR OF THE STATE OF NEW-YORK.

I submit a continuation of a Report on the Zoology of the State.

And have the honor to be,

With great respect,

Your obedient servant,

JAMES E. DE KAY.

INTRODUCTORY NOTICE.

The Mollusca, or *Shells* and *Shell-fish* as they are usually called, although several have no shells or calcareous coverings, present many objects of interest to the naturalist, and are not unimportant in their various uses to man.

The history of American Conchology must be necessarily brief. The earliest notices are derived from the labors of Garden, Michaux, and more especially of Bosc. Within our own times, we are chiefly indebted to Thomas Say, who occupies in this department the same eminence which he attained in every other branch of Natural History to which he directed his attention. The names of Lea and of Totten, of Adams, Couthouy, Haldeman, Barnes, Binney and Gould, will always be associated in the history of the progress of American Conchology. To the last named naturalist, it will be seen that I have been largely indebted for much valuable information derived from his History of the Invertebrata of Massachusetts. To the excellent cabinet of shells belonging to Dr. J. C. Jay of New-York, I have been chiefly indebted for opportunities of comparing our own with foreign species. My obligations to Dr. B. W. Budd, for many friendly services and important communications, will be found in the course of the work.

In giving a succinct account of such of the Mollusca of the State of New-York as have fallen under my notice, I have also endeavored to render it more extensively useful, by furnishing the student in every part of the Republic with increased facilities, by directing his attention to the species already described in many scattering volumes beyond his reach. In the progress of the work, I have been obliged to correct and revise so frequently what had been previously written, that at the conclusion I cannot dare to hope I have attained what I

proposed to myself at the commencement. That many errors may have escaped me, I think extremely probable ; such are, in fact, inseparable from the nature of the task. I can only hope that what has been done may be received in a proper spirit, not only by those who appear to think that "nobis" and "mihi" are the chief end and aim of natural science, but by the genuine student of nature.

The system of Cuvier has been adopted as the basis of classification, with such modifications as appeared to me necessary to render it more natural, and to correspond with my general plan. For the chief of these modifications, I am indebted to the excellent Manual of Sander Rang. My researches among the many volumes on this subject, both American and foreign, have been numerous; but it is chiefly to the labors of my own countrymen that I have been indebted for the following pages.

Syosset, Queens County.
February 1, 1844.

LIST

OF

CONCHOLOGICAL WORKS REFERRED TO IN THE DESCRIPTIONS OF THE MOLLUSCA.

Adams, C. B. Various contributions to the American Journal of Science and the Boston Journal of Natural History.

Anthony. Catalogue of the Terrestrial and Fluviatile Shells of Ohio. By J. G. Anthony. Cincinnati, 1843.

Barnes. On the Genera Unio and Alasmodonta, with introductory remarks. By D. W. Barnes. pp. 40. 14 figures. (Am. Jour. Sc. Vol. 6.)

Binney, A. Monograph of the Genus Helix. (Bost. Jour. Nat. Hist.)

" Descriptions of some of the species of naked air-breathing Mollusca inhabiting the United States. (From the Bost. Jour. Nat. Hist.)

Blainville. Manuel de Malacologie et de Conchyliologie. 8vo. Paris, 1825.

Conrad. Marine Conchology. 8vo. Philadelphia.

" Descriptions of Freshwater Shells. 12mo.

Couthouy. Descriptions of new species of Mollusca and Shells. By J. P. Couthouy. (Bost. Jour. Nat. Hist. 1838.)

Cuvier. Le Règne Animal distribué d'après son organisation. 4 vols. 8vo. Paris, 1818 et seq.

" The same, translated by Griffith. Vol. 12th.

Earle. History of Land and Freshwater Shells in Massachusetts. Dy J. M. Earle. (From Hitchcock's Catalogue.)

Eights, J. Various contributions to the Zodiac. 4to. Albany, 1835–6.

Ferussac. Histoire Naturelle générale et particulière des Mollusques terrestres et fluviatiles, etc. Paris, folio.

Gould. Lamarck's Genera of Shells, with a catalogue of the species. Translated by A. A. Gould. 12mo. Boston, 1833. pp. 110.

" Various contributions to the Boston Journal of Natural History.

" Report on the Invertebrata of Massachusetts. Cambridge, 1841. pp. 373.

Greene. List of the Marine Shells of Massachusetts. By T. A. Greene. (In Hitchcock's Catalogue.)

Guerin. Magazin de Zoologie, &c. Par F. E. Guerin. 8vo. Paris, 1831 et seq.

Haldeman, S. S. Monograph of the Limniades or Freshwater Univalve Shells of North America. Philadelphia, 1840 et seq.

Jay. Catalogue of Recent Shells in the Cabinet of J. C. Jay. 8vo. New-York, 1835. pp. 56.

" The same, with descriptions of new and rare shells, with four plates. 8vo. New-York, 1836. 2d ed. pp. 78.

" A Catalogue of the Shells arranged according to the Lamarckian system, together with descriptions of new and rare species, contained in the Collection of J. C. Jay, M. D. 3d ed. 4to. New-York. pp. 125, with ten plates.

Kirtland. Catalogue of the Testacea of Ohio. (First Annual Report of the Geology of the State of Ohio.) 8vo. Columbus, 1838.

LIST OF BOOKS.

LAMARCK. Histoire naturelle des Animaux sans vertèbres, etc. 7 vols. 8vo. Paris, 1815 et seq.

" The same. Third edition, edited by Deshayes and H. M. Edwards. Bruxelles, 1841 et seq.

LEA. Various memoirs in the Transactions of the American Philosophical Society, new series.

" Contributions to Geology. By Isaac Lea. 8vo. Philadelphia, 1833, with 228 figures.

" Synopsis of the Family of Naiades. 8vo. With numerous figures published separately.

LEACH, W. E. The Zoological Miscellany. 3 vols. 8vo. London, 1814 et seq.

LESUEUR. Descriptions of several new species of Ascidea. (Jour. Acad. Nat. Sciences, Vol. 3d.)

" Description of a new species of Cephalopode of the genus Loligo. (From the same.)

SANDER RANG. Manuel de l'histoire naturelle des Mollusques et de leur coquilles. 12mo. Paris, 1829.

SAY. Article Conchology, Nicholson's Encyclopedia, 3d American edition, Philadelphia, 1818. Afterwards published in a separate form, under the title of "Descriptions of the Land and Freshwater Shells of the United States." 8vo. Philadelphia, 1819. pp. 15, with 4 plates.

" American Conchology, or Description of the Shells of North America. 8vo. New-Harmony, 1831.

" Appendix to the Narrative of an Expedition to the Sources of St. Peter's River. By S. H. Long. 2 vols. 8vo. Philadelphia, 1824.

" Descriptions of some new species of Freshwater and Land Shells of the United States. (Jour. Acad. Nat. Sci. Philadelphia.)

" Descriptions of Marine Shells recently discovered on the Coast of the United States. (From the same.)

" Descriptions of some new Terrestrial and Fluviatile Shells of North America. New-Harmony Disseminator, 1829.

" Descriptions of several new species of Shells, and of a new species of Lumbricus. (Transylvania Journal, 1832.) These papers were afterwards published in a separate form, by Mrs. Lucy Say, New-Harmony, pp. 26.

SWAINSON. Treatise of Malacology, or the Natural Classification of Shells and Shellfish. 8vo. London, 1840.

TURTON. Conchylia Insularum Britannicarum. London. 4to. 1822.

WHEATLEY. Catalogue of the Shells of the United States, and their localities. 12mo. New-York, 1842. pp. 29.

WYATT. Elements of Conchology. 8vo.

SYNOPSIS

OF THE

NORTH AMERICAN FAMILIES AND GENERA OF MOLLUSCA DESCRIBED IN THIS WORK.

I. CEPHALOPODA.

SEPIADÆ,	Loligo.
SIPHONIDÆ,	Spirula.

II. PTEROPODA.

CLIONIDÆ,	Clio.

III. GASTEROPODA.

a. NUDIBRANCHIA.

DORIDÆ,	Doris.
TRITONIDÆ,	Tritonia.
GLAUCIDÆ,	Eolidia, Cavolina, Filurus.

b. INFRABRANCHIA.

HEMIPHYLLIDÆ,	Ancylus.

c. TECTIBRANCHIA.

ACERIDÆ,	Bulla.

d. PULMOBRANCHIA.

LIMACIDÆ,	Limax, Arion, Tebennophorus.
HELICIDÆ,	Vitrina, Helix, Pupa, Succinea, Bulimus.
AURICULIDÆ,	Auricula.
LIMNIADÆ,	Planorbis, Limnea, Physa.

e. OPERCULATED PULMOBRANCHIA.

CYCLOSTOMIDÆ,	Cyclostoma.
HELICINIDÆ,	Helicina.

f. PECTINIBRANCHIA.

TURBINIDÆ,	Paludina, Amnicola, Melania, Anculotus, Io, Littorina, Margarita, Cingula, Lacuna, Turritella, Pyramis, Odostomia, Vermetus, Skenea, Valvata, Natica.
TROCHIDÆ,	Ampullaria, Janthina, Scalaria, Tornatella, Pirena.

CERITHIDÆ, ---------- Cerithium, Buccinum, Purpura, Trichotropis, Cancellaria, Ranella, Columbella, Pyrula, Fusus, Pleurotoma, Rostellaria.

CONIDÆ, ---------- Conus.

MITRIADÆ, ---------- Terebra, Oliva, Marginella.

CRYPTOSTOMIDÆ, -------- Sigaretus, Velutina.

g. SCUTIBRANCHIA.

CALYPTRIDÆ, ---------- Calyptrea, Cemoria, Crepidula.

h. CIRROBRANCHIA.

DENTALIDÆ, ---------- Dentalium.

i. CYCLOBRANCHIA.

PATELLIDÆ, ---------- Patella, Patelloida.

CHITONIDÆ, ---------- Chiton.

IV. ACEPHALA.

a. BRACHIOPODA.

TEREBRATULIDÆ, -------- Terebratula.

b. LAMELLIBRANCHIA.

OSTRACIDÆ, ---------- Anomia, Ostrea.

PECTINIDÆ, ---------- Pecten, Plicatula, Lima.

AVICULIDÆ, -------- ---- Avicula.

ARCADÆ, ---------- Arca, Nucula.

MYTILIDÆ, ---------- Mytilus, Modiola, Crenella, Pinna.

UNIONIDÆ, ---------- Unio, Alasmodon, Anodon.

CARDIDÆ, ---------- Cardita, Cardium.

CHAMIDÆ, ---------- Chama.

c. CONCHIFERA.

TELLINIDÆ, ---------- Tellina, Donax, Capsa, Sanguinolaria, Lucina.

VENERIDÆ, ---------- Cyprina, Cytherea, Venus, Astarte.

CYCLADÆ, ---------- Cyclas, Pisidium, Cyrena.

SAXICAVIDÆ, ---------- Saxicava, Petricola.

MACTRIDÆ, ---------- Mactra, Mesodesma, Lutraria, Montacuta, Kellia, Cumingia, Gnathodon.

ANATINIDÆ, ---------- Osteodesma, Anatina, Cochlodesma, Thracia, Amphidesma.

MYADÆ, ---------- Pandora, Mya, Corbula.

SOLENIDÆ, ---------- Solen, Lepton, Solecurtus, Machæra, Solemya, Panopea, Glycimeris.

PHOLIDÆ, ---------- Pholas.

TEREDINIDÆ, ---------- Teredo.

V. CIRROPODA.

BALANIDÆ, ---------- Coronula, Balanus.

LEPADÆ, ---------- Anatifa, Cineras, Otion.

VI. TUNICATA.

Ascidea, Boltenia.

THE NEW-YORK FAUNA.

DIVISION II. INVERTEBRATED ANIMALS.

CLASS VI. MOLLUSCA.

ANIMALS OF A SOFT OR GELATINOUS STRUCTURE, NOT COMPLETELY SYMMETRICAL; WITHOUT ANY SOLID SKELETON OR VERTEBRAL CANAL, OR ARTICULATED LIMBS. ALMOST ALWAYS FURNISHED WITH A DEVELOPMENT OF THE SKIN, WHICH ASSUMES A MORE OR LESS HARD CONSISTENCE, UNDER WHICH THE ANIMAL CAN CONCEAL ITSELF. SOME HAVE A SOLID CALCAREOUS COVERING OF ONE OR MANY PIECES, WHICH ARE TERMED "SHELLS." CIRCULATION DOUBLE, THAT IS TO SAY, THE PULMONARY CIRCULATION DISTINCT AND COMPLETE; THE BLOOD WHITE OR BLUISH. BREATHE IN AIR OR WATER. OVIPAROUS AND VIVIPAROUS. CARNIVOROUS AND HERBIVOROUS. LIVING ON LAND, OR IN SALT AND FRESH WATER.

Obs. This class, in its now extended form, comprises all those animals of a soft or gelatinous structure, with the above mentioned characters, found on land or in the water, and which are known under the popular names of *Slugs*, *Cuttlefish*, *Sea-slugs*, and *Shellfish*. These latter, which form a very large proportion of the whole class, are commonly called *Shells*, from their hard calcareous coverings. The arrangement of these varied and often beautifully colored shells constitutes the science of Conchology; which, it will be perceived, is only a partial and incomplete view of the subject, unless accompanied with a study of the structure of the animals themselves. Various systems of arrangement have been proposed, each of which have some peculiar advantage; but none appears preferable, in its outline and philosophical spirit, to that proposed by Cuvier. We have therefore adopted it, with a few modifications from more recent writers.

ORDER I. CEPHALOPODA.

Animal enclosed in a muscular tunic open in front, from which arises a distinct head. In many species, this tunic is enlarged on each side into fleshy fins. Mouth terminal, armed with two horny mandibles, and the tongue with horny points. Eyes generally large, sessile. Head surrounded with numerous long fleshy arms or feet, serving for locomotion or prehension.

Obs. The animals of this order are exceedingly varied in their form, but all are united by the common character of feet or arms surrounding the head, which gives the name to the order. The sexes are separate. The shell either entirely external, or partially so; or wholly internal, rudimentary; univalve, of one or many chambers, and much varied in its form; the chambers connected. All marine. Many fossil genera.

FAMILY SEPIADÆ.

Animal sack-shaped, with or without fleshy fins. Head large, distinct, surrounded by eight or ten unequal arms with rows of suckers on their internal surface, and occasionally with hooks. Shell, when not external, represented by a solid cretaceous or horny and flexible substance within the body.

Obs. This family, originally equivalent to the old genus Sepia of Linneus, now comprises more than thirty species, arranged under eleven genera. It corresponds with the *Cephalopodes sepiaires* of Lamarck, and the order *Cryptodibranches* of Blainville. The animals comprising this family have been celebrated from the earliest times for their singular property of surrounding themselves with an inky fluid, with which they envelope themselves to evade pursuit. They are carnivorous, destroying many fish and crabs. The coloring substance named *sepia*, is obtained from these animals. In this country, their only use is as bait in the cod fishery.

GENUS LOLIGO. *Lamarck.*

Animal enclosed in an elongated cylindrical sac, enlarged into fleshy fins, and pointed beneath. Dorsal edge of the sac very distinct from the head, and sometimes elongated into a point. The eight sessile subequal arms furnished with suckers along their whole length; the two long arms with suckers on their enlarged extremities. Suckers occasionally furnished with hooks. The rudiment of a shell represented by a thin horny flexible blade, varying in form, but usually enlarged, and resembling a feather. This internal support, the horny jaws, and the ink-bags of various species, have been found fossil.

DSI

Loligo punctata.

PLATE I. FIG. 1.—(STATE COLLECTION.)

Description. Body cylindrical, tapering, about three inches in length, and with a slight ridge along the back, caused by the internal cartilaginous support. Body ends above in an acute point. The caudal appendage or fleshy fins terminal, broadly rhomboidal, and ending in an obtuse angle, nearly half the length of the body; lateral edges rounded, perfectly smooth on both sides, attenuated at the margins. Head moderately large, depressed; neck narrowed. Eyes large and prominent. Beneath the throat a prominent elongated muscular sac, opening externally by an irregular rounded orifice or vent.

Arms ten, of which the two superior are shortest and smallest, and furnished with rounded cup-like suckers attached to the arms by a central ligament. These suckers extend to the tips, but become gradually smaller until they are scarcely visible unless aided by the lens. The same remark applies to the other arms, and it may be observed that the suckers are placed in no regular order. The second pair similar in shape, but more robust, and equal in length to the fifth or inferior pair. The third pair remarkably robust, and exceeding in length the preceding. Fourth pair longest of all, and equalling the length of the head and body; cylindrical, dilated towards the extremity, and ending in an acute tip: the suckers are arranged irregularly over the dilated part.

Mouth central, sphincter-form, partly covered by an angular membrane with six short processes resembling the arms in miniature, and, like them, furnished with minute suckers. The internal cartilaginous support smooth, thin and translucent, resembling an ordinary quill; its superior portion being comparable to the barrel, and its broad dilated extremity to the web. The upper portion triquetrous, hollowed out beneath, carinate above, and producing a corresponding elevation externally along the back: it ends in an acute tip above. This ridge along the back becomes gradually effaced towards the lower extremity.

Color. The whole body, back of the head, fins and external parts of the arms covered with reddish rounded spots of various sizes; they are rather more sparse on the inferior surface of the sac. A row of these spots around the orbits, and behind the eyes they are so numerous as to give a darkened red appearance to that part. The external cuticle containing these spots is easily detached, leaving the denuded part of a pearly white.

Length of head and body, 4·0 – 6·0.

This beautiful *Squid* is nearly allied to the *L. pealii* of Lesueur; but this latter has its suckers arranged in two regular series, with the disks obliquely truncated. It has also a membrane along the lateral edges of the arms, and an acute termination of the caudal extremity.

Dr. Gould, in his valuable report on the *Invertebrata* of Massachusetts, has furnished us with an exceedingly interesting account of the habits of these animals. Their colors vary every moment from vivid red to deep blue, violet, brown or orange. Their usual mode of swimming is by dilating their body and filling it with water; the body is then suddenly con-

tracted, and the water forcibly ejected so as to propel them backward with great rapidity, shooting like arrows through the water. They devour great numbers of small fish and crabs.

The species above described is the only one I have noticed on the coast of New-York, although I think it highly probable that the six following, described in detail by Lesueur, will also at no distant day be detected on our coast. The plate referred to for the *punctata*, contains a figure of the cartilaginous, or rather membranous internal support; a figure of the oral apparatus (fig. 3); and a bunch of the egg-cases, or *sea-grapes*, as they are termed in Europe, with an embryo of a sepia highly magnified. This congeries I found on the northern shores of Long island.

(*EXTRA-LIMITAL.*)

L. pealii. (Lesueur, Ac. Sc. Vol. 2, p. 92, pl. 2. Pl. 38, fig. 354 of this work.) Surface covered with transverse striæ. Caudal extremity more than half the length of the body. Peduncles of the suckers on the long arms attached to an undulating lateral membrane. Suckers on the short arms obliquely truncated, each with six horny brown teeth. Length ——. *South-Carolina.*

L. illecebrosa. (Id. Ib. p. 95, pl. 10.) Arms two-thirds of the length of the body. Internal support dilated at both ends. Colors varying from bright red to deep blue. Eyes tinged with yellow. Length ——. *Sandy Bay, Mass.*

L. bartlingii. (Id. Ib. pl. 9.) Lateral arms compressed, and with the inferior pair furnished with a membrane upon all their exterior length. Arms long, filiform at their extremities. Internal support dilated near the middle, smaller at the ends. History imperfect. Deep blackish brown with numerous reddish brown points. *Gulf Stream.*

L. pavo. (Id. Ib. p. 96, pl. 11. Pl. 38, fig. 253 of this work.) Body elongated, funnel-shaped. Eyes very large. Arms very short, depressed. Tail cordate, ending in a point. Internal support subgelatinous, cylindrical, enlarged beneath, and terminating in a point. Color deep carmine brown, with numerous large rounded spots intermixed with smaller ones. Length of body 10 inches. *Sandy Bay, Mass.*

*L. bartrami.** (Id. Ib. p. 90, pl. 7. Pl. 37, fig. 352 of this work.) Arms subcompressed, with a large membrane at their inner angles. Fins united, entire, forming the third part of a circle of which the extremity of the tail is the centre. Suckers on the long arms in four rows; on the shorter ones, in but two. Internal support narrow, feeble, transparent, enlarged slightly above; cylindric, and ending in a small hollow cone beneath. Color violet blue passing into purple, with numerous brown points. *Coast of United States.*

L. brevipinna. (Id. Ib. Vol. 3, p. 282, pl. 10. Pl. 37, fig. 351 of this work.) Sac short, thick, cylindric anteriorly; subcompressed, obtuse and rounded beneath. Fins narrow, rounded, distant, half the length of the body; lateral edges rounded. Beak prominent, horny. Support large behind, narrow before. The long arms slender, much compressed at the end, and terminating in a point. Length of body nearly three inches. *Delaware Bay.*

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* I do not understand why Ferussac should have cited this species under his group of *Loligo*, which he says have no suckers on the long arms.

FAMILY SIPHONIDÆ.

Animal little known, with ten or more arms surrounding the mouth. Shell frequently spiral, many-chambered, connected by a siphon or tube external or partially covered by the animal.

GENUS SPIRULA. *Lamarck.*

Animal purse-shaped, surrounding partially a shell in its posterior part. Head with ten arms furnished with suckers; two of these pedunculated and contracted. Shell spiral, discoid, with the turns separated from each other. The siphon on the internal border.

Spirula peronii.

PLATE XXXV. FIG. 332.

Nautilus spirula. Linn. Syst. Nat.
S. australis. Cuv. Règne animal, Vol. 12, p. 12, pl. 5, fig. 8.
S. peronii. Lamarck, An. sans vertèb. Vol. 7, p. 600. Gould, Invert. Mass. p. 317.

Description. Shell fragile, white or pearly, occasionally yellowish, with two or three spiral turns which do not touch each other. The place of the partitions of the chambers within are exhibited by circular grooves in the shell. As yet but one species is said to have been discovered, common to the Atlantic and Pacific oceans; it is probable, however, from the difficulty of observing recent specimens, that two if not more species exist. The chambers communicate by a siphon on the interior sides of the turns. Diameter 1·0 – 1·5.

The beautiful little shell belonging to this species is occasionally picked up along our shores after heavy storms. The nature of this animal was first detected by Peron, and hence we are enabled to infer the structure of those which inhabited the numerous fossil shells of a similar conformation. Such are the *Orthoceratites*, *Ammonites*, *Bacculites*, *Scaphites*, *Belemnites*, &c. The nature of this work does not admit of their admission here, more particularly as they will all be described in the forthcoming work on the fossils of the State of New-York, included in the Report on the Natural History of that State.

Those who are desirous of becoming acquainted with the numerous fossil shells of the United States belonging to this order, will find abundant materials in the *American Journal of Science*, *Annals of the Lyceum of Natural History of New-York*, *Journal of the Academy of Natural Science of Philadelphia*, and in a volume published by Lea, entitled "*Contributions to Geology.*" To those who wish to study the structure of the animals of this order, we would refer to the Memoirs of Messrs. Owen and D'Orbigny on this subject, and to the Bridgewater Treatise on Geology and Mineralogy by the English professor Buckland.

ORDER II. PTEROPODA.

Body free, without arms or feet, but with two equal and opposite fins placed one on each side of the mouth. Shell either present or entirely wanting; when present, fragile, variable in form. All marine.

Obs. This order contains but few species, all small and hermaphrodite. The presence or absence of a shell, with other modifications of structure, suggest a division into two distinct families. I have not met with any representatives of the first family *Hyalidæ*, on this coast.

FAMILY CLIONIDÆ.

Without any shell, but in its place a muscular covering. Head distinct; no intermediate lobe, but with one or several fleshy appendices in its stead.

GENUS CLIO. *Brug.*

Body oblong, sub-cylindrical, tapering, contractile. Head formed of two rounded tubes, from which issue long retractile tentacula. Fins with a vascular net-work serving as gills.

Clio borealis.

PLATE I. FIG. 2.

Clione. Pallas, Spicilegia Zool. p. 28, pl. 1.
Clio borealis. Lin. Syst. Nat. Cuv. Mollusques, p. 1, pl. 1, figs. 1, 2.
C. id. Lam. An. sans vertèb. Vol. 6, p. 288.

Description. Oblong, gelatinous, slightly compressed, tapering behind, truncated in front, obscurely constricted in the middle. Head prominent, surrounded by retractile fibres, divided by a furrow into two distinct tubercles, each pierced with a foramen, through which are protruded three small tentacula. Fins two, opposed on each side of the neck, sub-triangular. The excretory and generative ducts placed on the neck, under the fin of the right side. Two small fleshy lips in front of the mouth.

Color. Whitish transparent, occasionally tinged with reddish.

Length, 0·5 – 0·9.

This species occurs in almost incredible numbers in the Northern Atlantic, where it forms the ordinary food of whales. It has been observed occasionally in great numbers in our bays. In April, 1833, they were very abundant, and of a blood-red color. After a few days, they all disappeared.

ORDER III. GASTEROPODA.

Body free, without any distinct arms, but with a fleshy foot extending under the body, adapted for crawling, and in a few cases for swimming. A distinct head, furnished with one or several pairs of tentacula. Upon or near these are placed the eyes. Shell either entirely wanting or rudimentary, but for the most part complete. Generative organs usually on the right side.

Obs. This order embraces an immense number of Mollusca, particularly of those furnished with shells, which are usually termed *shellfish.* Their number requires their division into several orders, or, as we shall term them, sections, divided after Cuvier from the form and position of the gills or lungs.

SECTION 1. NUDIBRANCHIA.

Gills in naked tufts rising from the back, always symmetrical either on the sides or median line. No shell whatsoever. Marine.

Obs. We have numerous species on our coast, but they have not yet been much studied. They are often seen swimming in a reversed position, employing the margin of their mantle and the tentacula as oars. Others are found in the ocean, attached to fuci.

FAMILY DORIDÆ.

With four tentacula; two above, and two beneath under the edge of the mantle. Gills arborescent, and forming on the median line a group around the vent.

GENUS DORIS.

Body oblong, flattened or cylindrical, bordered with a loose membrane surrounding it, and extending occasionally beyond the head. Upper tentacula on the anterior part of the body, in a cavity; the other two, conic, and situated under the anterior edge of the mantle. Mouth at the extremity of a small tube. Foot oblong. Vent on the median line, on the posterior part of the back. Gills prominent, fringed and laciniated. Sexual orifice under the right margin of the mantle.

Doris illuminata.

Doris illuminata. Gould, Invertebrata of Massachusetts, p. 4.

Description. Animal prismatic, somewhat four-sided; the back arched. Front of the foot slightly dilated at angles. Upper lip full, and strongly pursed. A line of six tubercles on each side, diverges from the front to each side of the tentacula, making the back at this part of a four-sided form. Between these and the branchial tuft are four more tubercles on each side, in parallel lines; and then follow two on each side, much longer than the rest, of a somewhat club-shaped form, followed by a few smaller ones towards the tail. Sides and back dotted by several small tubercles. Gills fringed, arranged in a semicircle.

Color. Pearly white or light dove-color, dotted with greenish. All the tubercles, tentacula and gills, tipped with bright sulphur-yellow.

Length, 0·75. Breadth, 0·25.

This species was first noticed by Dr. Gould in Boston bay. I have adopted his description, believing that the same species exists on our coast.

FAMILY TRITONIDÆ.

The two upper tentacula retractile into a sort of sheath. A membranous veil, of greater or less extent, above the mouth. Vent and sexual orifice distant, on the right side. Respiratory organs variously formed, but arranged in two longitudinal series.

Obs. This family, which corresponds with the *Dicères* of Blainville, now includes four genera. The representative of one genus has been observed on our coast.

GENUS TRITONIA. *Cuvier.*

Body oval, oblong, convex above. Mouth with two lateral jaws, sharp, horny and denticulate on the edges. Foot long, canaliculate. Gills arborescent, arranged in a longitudinal series on each side of the back. Sexual organs united on the right side in front. Vent posterior to them, and near the middle of the back.

Tritonia reynoldsi.

PLATE V. FIG. 94.—(CABINET OF THE LYCEUM.)

T. reynoldsi. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 74, pl. 2, figs. 1, 2, 3, 4.
T. arborescens. Gould, Invertebrat. Mass. p. 5.

Description. Body tapering to the tail, which ends acutely. Sides with numerous papillæ. Head short, depressed, orbicular, supporting three pair of gills. Mouth crescent-shaped,

papillose, with strong transverse folds. Jaws angular. Tentacula arising from the back of the head, and received into a round sheath which terminates in five unequal branches. Five pair of dorsal gills, all susceptible of being retracted into the body of the animal, leaving in their places small tubercles. Sexual orifice closed by a conical valve, attached before. Anal orifice between the first and second pair of dorsal gills.

Color. Rufous brown, occasionally dark brown, with patches of white on the back between the branchial tufts. Foot white, diaphanous.

Length, 3·5.

Mr. Couthouy found this animal about the bathing-houses and timber-docks in Charles river; and as it differed in many respects from the *T. arborescens* of Cuvier, he described it as a new species. Recently Dr. Gould has referred it, on the authority of Dr. Lovèn of Stockholm, to the species described by Cuvier.

FAMILY GLAUCIDÆ.

Animal furnished with two and sometimes three pair of tentacula. Gills strap-shaped, or in the form of cirri.

GENUS EOLIDIA. *Cuvier.*

Body oblong, slug-shaped, gelatinous, terminating in a point behind. Head distinct, with four tentacula above, and occasionally two on the sides of the neck. Gills prominent, composed of conical or flattened cirri arranged in longitudinal series along the back. Sexual and anal orifices separate, on the right side.

EOLIDIA BOSTONIENSIS.

PLATE V. FIG. 96.—(CABINET OF THE LYCEUM.)

Eolis bostoniensis. COUTHOUY, Bost. Jour. Nat. Hist.
E. rufibranchialis? GOULD, Invertebrata of Mass. p. 6.

Description. Body oblong, with a slight protuberance on the centre of the back. Head orbicular, short, with four tentacula: two lateral and longest; the other pair on the back of the head, with the eyes near their base. Beneath the mouth are two other appendages resembling tentacula. Mouth large and fleshy. Lips hemispherical. Branchiæ tubular, arranged in five clusters on a side. Sexual orifice just behind the anterior cluster of gills on the right side; the vent near the back, between the third and fourth branchial group.

Color. Brownish white: lateral tentacula, lake tinged with blue; the other pair dark flesh-color. Gills brown tipped with white.

Length 1·5.

Eolidia diversa.

PLATE V. FIG. 97.

E. diversa. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 187, pl. 4, fig. 14.

Description. Body elongated, acute behind. Head distinct, sub-orbicular, depressed, with two long slender lateral tentacula arising from near its junction with the neck; two round and smooth shorter ones on the back of the head, a little behind the others. Eyes minute, just behind the latter pair. Branchial cirri disposed in a double series along the back. Sexual orifice large, just behind the neck on the right side; vent a short distance behind and below it. Foot divided at its origin, forming two processes.

Color. Semitransparent pale yellow, tinged with red. Branchial cirri internally orange.

Length, 1·2. Breadth, 0·35.

Found near the roots of *Lancinaria saccharina,* on the coast of Massachusetts.

Eolidia gymnota.

PLATE V. FIG. 95. — (CABINET OF THE LYCEUM.)

Eolis (Tergipes) gymnota. Couthouy, Bost. Journ. Vol. 2. p. 69, pl. 1, fig. 3.

Description. Body elongated, slender, tapering gradually to the tail. Neck very distinct. Head short, depressed, orbicular, perpendicularly linear. Tentacula four: the lower pair round, smooth on the front of the head, and an eighth of an inch long; the other pair rather shorter, serrated, and on the back of the head. Gills disposed in seven remote clusters along the sides; the medial longest. Back with a central elevation. Sexual organs on the right side, below the first group of branchiæ. Vent on the same side, higher up, and between the third and fourth group of branchiæ.

Color of the gills reddish brown. Foot transparent.

Length, 0·9.

The animals of this section are very varied in form, and our acquaintance with them is but of modern date. I place provisionally here an inhabitant of our salt water which I have nowhere seen described, and which was sent to me under the name of *Aquatic larva,* from the Hudson river, a short distance above the city.

GENUS CAVOLINA. *Brug.*

The general form and habits of the preceding, with retiform branchiæ arranged in a series on the dorsal surface on each side of the medial line.

Cavolina salmonacea.

PLATE VI. FIG. 116.

C. salmonacea. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 68, pl. 1, fig. 2.
Eolis id. Gould, Invertebrata of Mass. p. 6.

Description. Body nearly diaphanous. Back with a conspicuous elevation in the middle. Head large, with four tentacula; the superior minutely serrated. Mouth an inverted Λ. Branchiæ in longitudinal series, to the number of one hundred or more. Foot with two short processes in front, and ending in a point behind. Sexual appendages placed in a large tubercle on the right side, a short distance behind the neck. Vent on the same side, near the centre of the body.

Color. Pale yellowish white. Branchial cirri salmon-colored, bordering on orange.

Length, 1·7.

GENUS FILURUS.

Tentacula two. Gills in two series along the back. Vent terminal. Caudal appendage long and filiform.

Filurus dubius.

Description. Body cylindrical, enveloped in a loose transparent membrane through which the intestinal tube is apparent. Along the back are two rows of branchial? processes, six in number on each side; at their tips, furnished with five or six spiculæ: these are only seen when the animal is in motion. Mouth terminal, composed of a loose festooned membrane, alternately dilating and contracting when the animal is in motion; when dilated, two small transparent tentacula are protruded. The abdomen, or upper surface, appears to be composed of numerous rings. The caudal portion becomes abruptly smaller than the body, is long, cylindrical, and tapering to a point.

Color. Abdomen silvery white; dorsal region and sides light brown; tail light greenish. The color of the body, however, appears to depend on the contained viscera.

Length of body, 0·5; of tail, 0·7.

This curious animal was taken while swimming in salt water with its body reversed. Its motion was vermicular, and it appeared to be very tenacious of life, as it lived several days in a vessel containing salt water which had not been renewed.

SECTION 2. INFRABRANCHIA.

With nearly the same form and organization as in the preceding section; but their gills, instead of being placed on the back, resemble one or two long series of laminæ under the mantle, either surrounding the body, or on the right side only. One or two pair of tentacula. Occasionally an external or internal shell.

Obs. This section has been subdivided into two families, viz. *Phyllidia*, where the branchiæ are on both sides, and no shell is present; and *Hemiphyllidia*, where the gills are on the right or left side only: sometimes with a shell. To this latter we refer the following genus.

GENUS ANCYLUS. *Müller.*

Animal oval. Head large, with two large cylindrical contractile tentacula; the eyes placed at their internal bases, and with a contiguous foliaceous appendix on the outer side. Mouth beneath. Foot large, elliptical. Gills in a cavity on the left side, between the mantle and foot. *Shell* patelliform, obliquely conical. Apex inclining forward and to one side. Aperture more or less oval.

Obs. The true position of this genus is yet far from being well established. It cannot, however, well be arranged with the other freshwater mollusca, inasmuch as it is branchiferous, whilst they are pulmonous. The animals of this genus abounds in freshwater streams and ponds, climbing over stones and aquatic plants. We enumerate the following species.

Ancylus rivularis.

PLATE V. FIG. 98. A. B. — (STATE COLLECTION.)

Ancylus rivularis. Say, Nich. Encyc.; Journ. Acad. Nat. Sc. Vol. 1. p. 124.
A. id. Gould, Invert. Massachusetts, p. 224, fig. 153.

Description. Shell corneous, opake, small, narrow. Apex obtuse, almost central, nearer to and leaning towards one side and one end. Aperture oval, somewhat narrower at one end.
Color. Greenish or dark green, with a dull brown epidermis; within, milk white or brown.
Length, 0·2 – 0·25. Height, 0·1.
Common. Adhering to stones and aquatic plants in streams and ponds.

Ancylus calcarius.

PLATE V. FIG. 99. A. B. — (STATE COLLECTION)

Description. Shell conic, calcareous, opake. Apex not central, moderately prominent. Aperture oval, entire; the curves on the longest sides dissimilar. In very minute specimens, the edges somewhat everted.

Color. Epidermis rufous, extending beyond the edges of the aperture; within, bluish white, darker towards the apex.

Length, 0·3. Height, 0·12.

The specimen which furnished the above description was one of the largest which I have seen. They are more commonly of the dimensions of *A. rivularis*. I separate it from this latter, chiefly on account of its solid calcareous structure. I am indebted to Mr. I. Cozzens for the specimens from the Passaic river, near Patterson; but it will doubtless be found in this State.

Ancylus fuscus.

A. fuscus. Adams, Bost. Jour. Nat. Hist. Vol. 3, p. 329, pl. 3, fig. 17.
A. id. Gould, Invertebrata Mass. p. 224, fig. 152.

Description. Shell rounded oval, the entire outline regularly curved, thin and pellucid, depressed; convexity regular, not compressed at the sides. Apex obtuse, a little to the right of the centre. Epidermis coarse, strong and rough, extending beyond the margin of the shell.

Color. Epidermis dusky yellowish brown; within, glistening, polished.

Length, 0·3. Height, 0·01.

This species has been observed in Massachusetts, and will probably be found in this State. It appears to be a very distinctly marked species.

(*EXTRA-LIMITAL.*)

A. tardus. (Say, Des. terr. et fluv.) Shell conic, depressed. Apex behind the middle, obtuse, rounded, inclining backwards, but not laterally. Line from the apex to the posterior tip rectilinear; line from the apex to the anterior tip arcuated. Aperture oval, not distinctly narrowed at one end. Length, 0·15; breadth, 0·1. *Wabash River.*

A. filosus. (Conrad, Fresh Water Shells, p. 57.) Shell regularly oval, rather elevated, with numerous radiating prominent lines. Apex very prominent, inclined, eroded, not nearly central. Abundant on *Melania. Alabama.*

A. nuttallii. (Hald. Monog. Lymn. No. 3.) Shell oval, elevated. Apex one-fourth of the entire length from one end. *Color* fuscous. Length, 0·3; breadth, 0·25; height, 0·09. *Oregon.*

A. diaphanus. (Hald. Ib.) Shell regularly oval, very wide, depressed. Apex sub-central. *Color*, very pale, translucent. Length, 0·25. *Ohio.*

A. parallelus. (Hald. Adams, Am. Jour. Vol. 40, p. 275.)

SECTION 3. TECTIBRANCHIA:

The branchiæ are on the back, a little inclining to the right, composed of lamina more or less divided but not symmetrical, generally protected by expansions of the mantle. Generative organs on the same individual, but distant on the right anterior side, and connected by an external furrow. They are more or less covered by a mantle, in which there is generally a small shell.

FAMILY ACERIDÆ.

Animal divided into lobes or distinct parts, of which the lateral ones dilate into expanded fins. No tentacula, or at least the tentacula unite into a sort of disk in front. Branchiæ in a cavity on the back, somewhat posterior and a little on the right side. Shell covered by the mantle, external, internal, or entirely wanting.

GENUS BULLA. *Linnæus.*

Animal oblong, obtuse at the two extremities, divided into four lobes. Head not distinct. Foot expanded, bent on the right side. Genitals on the same side, distant. *Shell* thin, oval or cylindrical, and nearly covering the animal. The last whorl enclosing all the others, and rarely exhibiting any spire. Aperture long and narrow, nearly the length of the shell; lip sharp.

Bulla insculpta.

PLATE V. FIG. 100. A. B —(STATE COLLECTION.)

Bulla insculpta. Totten, Am. Jour. Sc. Vol. 28, p. 350, fig. 4.
B. id. Gould, Inverteb. Mass. p. 162, fig. 92.

Description. Shell small, thin, fragile, pellucid, oval, impressed at the top, regularly rounded and widest below, with many slight longitudinal wrinkles, a few obsolete longitudinal waves, and very numerous equal impressed revolving lines. Spire none, but in its place a pit not deeper than the origin of the right lip. Aperture nearly linear above, thence expanding to a considerable breadth. Right lip regularly arched, sharp, rising from the axis with a regular curve upwards and forwards, higher than the shoulder of the shell. Left margin, above, a thin plate glued upon the convexity of the second turn; below, rolled into a kind of spiral pillar. Umbilicus none; a very thin plate of enamel covering the inner margin.

Color. White with a tinge of bluish.

Length, 0·35 – 0·45. Diameter, 0·23 – 0·25.

This species, which was first detected and described by Col. Totten of the U. S. Engineers on the coast of Rhode-Island, and subsequently along the shores of Massachusetts, has also been observed on our own coast. Those obtained by Dr. Jay near Rye, at low water on the surface of the mud, are much larger than the Rhode-Island specimens, with which, through the kindness of Col. Totten, I have been enabled to compare them. Mr. I. Cozzens has obtained them from Staten island, below Quarantine ground, in seven or eight feet water; and Dr. Stillman, by dredging in the East river above Corlaer's hook. These latter were olive-green, and covered with a rust-colored epidermis. When a number of these specimens are kept in a close vial, they communicate a deep olive-green color to the water.

Dr. Gould has thought proper to refer the *solitaria* of Say to this species.

Bulla gouldii.

PLATE V. FIG. 101.

Bulla gouldii. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 181, pl. 4, fig. 6.
B. id. Gould, Invertebrata of Mass. p. 163, fig. 94.

Description. Shell thin and brittle, small, ovate, convolute; of four convolutions, rounded at their upper edges, and having their sutures well defined, the last whorl with numerous fine transverse striæ. Spire depressed, discoidal, sometimes slightly mammillated: incremental striæ very indistinct; lower extremity rather narrower than the upper. Aperture narrow above, and abruptly dilated towards the base by the arcuated inner margin, which is a little thickened, white and polished. No umbilicus.

Color. Shining dead white, with a yellowish epidermis.

Length, 0·3. Diameter, 0·1.

This species was first described by Mr. Couthouy, from specimens obtained from the stomachs of fishes; and was subsequently dredged by Col. Totten, in Provincetown harbor, Mass. It will probably be found on our coast. Distinguished from *insculpta* by its flat summit, displaying all the whorls.

Bulla obstricta.

PLATE V. FIG. 102. Magnified.

Bulla obstricta. Gould, Am. Jour. Sc. Vol. 38, p. 196.
B. id. Gould, Invertebrata of Mass. p. 167, fig. 96.

Description. Shell oval, cylindrical, rather solid, small. Whorls five, the last nearly involving all the others, pressed in or obstricted at the middle, dilated beneath, and forming a fold at the umbilical region. Spire obtuse, rising above the junction of the lip to about one-fifth the length of the shell: upper whorls suddenly smaller. Suture deep, apparently double in old specimens; or, rather, a narrow and deep line revolving on the shoulder of each whorl

near the suture, forms a channel. Aperture narrow above, enlarged beneath. Outer lip sharp, entire, joining the preceding whorl by a gradual approach, and then turning down the inner border in the form of a thick slightly attached plate of enamel: As it turns back from the front, it becomes thicker and rounded, and at the umbilical region it enters the shell, and forms a conspicuous fold.

Color. Whitish or pale horn-color, with a thin ferruginous epidermis.

Length, 0·1 – 0·2; diameter 0·07 – 0·1.

Found in the stomachs of fishes on the shores of Massachusetts, and by dredging in the harbor of New-York below the Quarantine ground. The presence of a prominent spire in this and a few other species, with a fold on the columella, would seem to indicate the necessity for a subgeneric division. The characters assigned by Lamarck, "n'ayant point de columelle ni de saillie à la spire," certainly require revision. The *B. canaliculata* of Say, which belongs to this division, is referred by that author to *Bullina* of Ferussac, on account of the animal having two distinct tentacula; but this would necessarily remove it from the present family. I am not aware that Deshayes, who says that the animals of the two genera agree exactly, has had an opportunity of examining Mr. Say's species. I scarcely know what to make of another species described by Mr. Say as a *Bulla*, under the name of *B. fluviatilis* (*Journ. Acad.* Vol. 2, p. 178), inhabiting fresh water. All the known species are marine. It may possibly prove to be what I have ventured to describe under the name of *Physa planorbula*.

Bulla lineolata.

PLATE 35 FIG. 334.

Bulla lineolata. Couthouy, Bost. Journ. Nat. Hist. Vol. 2, p. 179, pl. 3, fig. 15.
B. id. Gould, Invertebrata of Mass. p. 169, fig. 99.

Description. Shell very small, oblong-ovate, broadest at the base, thin and fragile. Whorls three; the last inflated, and enveloping all the others, with numerous impressed minute revolving striæ. Spire little, prominent, flattened, with the outer lip arising from near its summit. Aperture the whole length of the shell, narrow above, dilated beneath, somewhat effuse at the base; a faint oblique fold near the middle of the columella.

Color. Pale brown, with a thin ferruginous epidermis; within, glossy yellowish white.

Length, 0·15; diameter, 0·07.

This very delicate and minute shell has as yet only been observed by its original describer, in the stomachs of haddocks and other fishes on the northern coast.

Bulla triticea.

PLATE XXXV. FIG. 326.

Bulla triticea. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 88, pl. 1, fig. 8.
B. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 75.
B. id. Gould, Invertebrata of Mass. p. 165, fig. 98.

Description. Shell polished, cylindrical, rather solid. Spire slightly depressed, imperforate. Surface traversed longitudinally and transversely by numerous microscopic striæ. Lip inserted into, or rather arising from, the margin of the circular pit at the summit of the spire. Aperture narrow above, almost linear, except at the base, where it is dilated to double its previous breadth by the sudden curvature of the columella, which is slightly reflected upon the body of the shell. At the region of the umbilicus is a flattened white space, thickened by enamel, gradually disappearing within the aperture. The whole inner margin is sometimes slightly coated with enamel.

Color. Dull white, covered with a thin shining ferruginous epidermis. Columella white.

Length, 0·3; diameter, 0·1.

Neither this shell nor the preceding has been yet found *in situ.* The present species has only been obtained from the maws of fishes on the coast of Massachusetts, but will probably be found here.

Bulla debilis.

PLATE XXXV. FIG. 329.

Bulla debilis. Gould, Am. Jour. Sc. Vol. 38, p. 196.
Bulla debilis. Id. Invertebrata of Mass. p. 164, fig. 95.

Description. Shell small, obliquely ovate, tumid, thin and brittle. Whorls four, all rising to about the same height; divisions distinct, each very convexly rounded. Last whorl the whole length of the shell, including all the others, and partially detached from them above. Surface smooth, without any apparent mark. Aperture as long as the shell, widening from above. Outer lip attached behind, a little before the summit of the shell, rising to a level with the spire, then descending in a regular though slightly waved curve to the front of the pillar, where it terminates abruptly. Inner lip spread out into a thin enamel upon the body of the shell, partially covering an umbilical indentation placed at about one-fourth the length of the shell.

Color. Greenish white.

Length, 0·1; diameter, 0·13.

According to its original describer, this shell has as yet no determinate locality, being obtained only from the maws of fish in Massachusetts bay. The same writer suspects that it may possibly be the young of *B. gouldi,* and that it bears a striking resemblance to the

Diaphana pellucida of Brown (*Conchology of Great Britain*, pl. 38, fig. 10, 11). It bears a resemblance in its contour to the *B. fontinalis* of Say, which we are inclined to suspect to be a *Physa*.

Bulla hiemalis.

PLATE XXXV. FIG. 335.

Bulla hyemalis. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 180, pl. 4, fig. 5.
B. id. Gould, Invertebrata of Mass. p. 163, fig. 100.

Description. Shell globular, minute, very thin and brittle. The body-whorl enveloping all the others so as to leave no perceptible spire, and marked with the lines of growth. Aperture narrow above, dilated beneath. Outer lip strong, and regularly curved: it revolves from its junction behind, nearly a third of a revolution, before it turns forward. Columella slightly arcuated, and reflected upon the body of the shell, so as to form a small but distinct umbilicus.

Color. Hyaline, with a brownish tinge, except near the tip, where it is whitish.

Length, 0·1; diameter, 0·1.

Stomachs of codfishes on the coast of Massachusetts.

Bulla oryza.

PLATE XXXV. FIG. 327.

Bulla oryza. Totten, Am. Jour. Sc. and Arts, Vol. 28, p. 350, fig. 5.
B. id. Gould, Invertebrata of Massachusetts, p. 168, fig. 93.

Description. Shell minute, not very thin, regularly diminishing from the middle towards each end; the tip being depressed into a shallow pit, and the base rather acute. Surface marked with numerous minute lines of growth, and with a number of impressed revolving lines on the lower portion, and a few more obscure ones near the shoulder: none of them perceptible without a magnifier. Aperture as long as the shell, narrow above, and widening gradually downwards. Outer lip sharp, simple, regularly arched, rising above a little higher than the shoulder. Left margin thickened below into a stout, smooth and glossy pillar, which is twisted so as to form an oblique fold: it terminates abruptly beneath, truncated. No umbilicus either at the tip or the base.

Length, 0·3; diameter, 0·1.

Found originally by Col. Totten in muddy bottoms at Newport, and since in New-Bedford harbor. It has not yet been noticed north of Cape Cod, but will probably be discovered on our coast.

Bulla canaliculata.

PLATE XXXV. FIG. 328.

Volvaria canaliculata. Say, Jour. Acad. Nat. Sc. Vol. 5, p. 211.
Bullina id. Id. American Conchology, pl. 39.
Bulla id. Gould, Invertebrata of Massachusetts, p. 116, fig. 97.

Description. Shell minute, cylindrical, polished, with very faint lines of growth. Spire convex, a little elevated, with a minute but prominent tip: whorls about five, with their shoulders very obtusely grooved. Outer lip arching forward; inner lip with a thin coat of enamel, with a single oblique fold or small tooth near the base.

Color. Whitish, immaculate.

Length, 0·1 – 0·2.

This species, first observed by Say on the southern coast, has since been found on the shores of Martha's Vineyard. It will, therefore, doubtless be discovered on the coast of New-York.

This, with *B. obstricta*, are the only two American species yet observed, possessing a prominent spire. I place the present species here with great doubt, which can only be settled by a minute examination of the animal.

(*EXTRA-LIMITAL.*)

B. solitaria. (Say, Acad. Nat. Sc. Vol. 2, p. 245.) Shell very thin and fragile, pellucid, oval, narrowed at the base, with numerous impressed revolving lines and transverse very obtuse wrinkles. Aperture surpassing the tip of the shell. Spire none, substituted by an umbilicus. No umbilicus at the base. Length 0·5. *Southern coast.*

Supposed by some American writers to be identical with *B. insculpta.*

SECTION 4. PULMOBRANCHIA.

Animals furnished with a foot for crawling. No gills, but instead thereof a pulmonary cavity, receiving the surrounding medium by an aperture on the right side of the mantle. Organs of generation in the same individual, united in the same cavity, or distant. Shell complete, rudimentary or none, external or internal. Without opercle.

Obs. This section comprises numerous families, extended over the globe. They are terrestrial or aquatic. Those found in water live at a small depth, as they are compelled to rise frequently to the surface to breathe. They are carnivorous and herbivorous.

FAMILY LIMACIDÆ.

Body elongated, semicylindrical, flattened beneath. A wrinkled mantle on the anterior part of the body in most species, sometimes covering the whole superior or entirely wanting surface. In this mantle is occasionally found a flat shell, or more frequently a few calcareous grains. Two or four retractile tentacles; the upper and posterior pair larger, oculiferous. When only two tentacles, there is a pair of labial appendices. The pulmonary cavity variously placed. The position of the vent variable. Terrestrial or marine.

Obs. The animals of this family are known in popular language under the name of *Slugs*, or *Slug-worms*. They inhabit moist places, and move by successive contractions of the muscular fibres of the foot, leaving a shining trace in their path. Feed on vegetables, and are very voracious. They are mischievous in the gardens in some parts of Europe; but owing probably to the lesser humidity of our climate, their numbers, and consequently their injurious effects are comparatively trifling here.

The *Limaces* of the United States have, until recently, been little studied. Mr. Binney is the only American naturalist who has investigated the subject to any extent, and his nomenclature will for the most part be adopted in this family.

GENUS LIMAX. *Linneus. Lamarck.*

Animal with its body more or less elongated, semicylindrical, tapering to a point. Mantle partial, and placed on the anterior portion of the body, wrinkled. Head tolerably distinct, retractile. Four retractile tentacles; the upper pair longest, and bearing the eyes. Foot occupying the lower part of the body, without processes, and scarcely distinct from the rest of the body. Breathing-hole and vent on the right side of the body. Generative orifice between or near the upper tentacles.

Limax agrestis.

PLATE I. FIG. 4. — (STATE COLLECTION.)

L. agrestis. Linn. Lam. An. sans vert. Ed. 2, Vol. 3, p. 264.
L. tunicata. Gould, Invertebrata of Mass. p. 3.
L. agrestis. Binney, Desc. Limacidæ, Bost. Journ. Nat. Hist. Vol. 4.

Description. Body with numerous minute longitudinal interrupted wrinkles, and a distinct ridge extending from between the upper pair of tentacles to the mantle, with a furrow on each side. Foot narrow, with two distinct longitudinal furrows on each side. Tail somewhat acute. Mantle contains within the rudiment of a delicate oval shell. The mantle is elliptical or oblong-oval, much elevated, convex, and, in a state of repose, covers nearly one-half of the body; when in motion, scarcely equals one-third of the length of the body: its surface with

distinct concentrical furrows, centering on its posterior portion. Breathing-hole on the right side,* above the lower edge, and in the posterior third portion of the mantle. Vent adjacent, and slightly above and anterior to it. Upper tentacles terminating in a small bulb ; lower tentacles much shorter.

Color. Various, but most usually dark reddish or chocolate-brown, varied with numerous minute blackish brown dots and lines ; the mantle somewhat darker. Occasionally the general color is greyish. Tentacles darker than the general color. Foot beneath flesh-colored. Breathing-hole greyish or white on its margin.

Length 1·5 – 1·7.

Found on the underside of leaves and decayed branches lying on the ground; also under stones and boards. Their chief food appears to consist of succulent leaves. Rarely seen during the day. I make no reference to names of species published by myself some years since, as the descriptions have been anticipated. This species varies much in its color and markings, and is invariably smaller than the following.

Limax flavus.

PLATE I. FIG. 5.

Limax flavus. Linn.
L. variegatus. Lam. An. sans. vert. Vol. 3, p. 266, No. 15.
L. flavus. Binney, Limacidæ, Bost. Jour. Vol. 4.

Description. Surface with long narrow prominent tubercles. Mantle short, broad, oval, concentrically striated. Breathing-hole large, near the posterior part of the mantle, and cleft to the edge. Neck smooth. Body terminating acutely behind, with a short ridge.

Color, varying from deep reddish brown to light ferruginous, mottled with oblong-oval greyish spots. Mantle with rounded spots. Head, neck and upper tentacles much lighter than the general hue: the latter lineated with dusky at their bases. Foot greyish on the margin.

Length, 2·0 – 2·8.

This species was obtained from gardens in the city of New-York. It has also been noticed in Philadelphia. I have adopted the names proposed by Mr. Binney, but with much scepticism in relation to the introduction of foreign species of this family. I have, however, had no opportunity of studying the foreign species to which these have been referred.

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* Through inattention, both the figures of *Limaces* in Plate I. are represented with the breathing-holes on the left side.

Limax campestris.

L. campestris. Binney, Family Limacidæ, op. sup. cit.

Description. Body cylindrical, elongated, terminating in a very short carina at its posterior extremity. Mantle oval, fleshy, but little prominent, with fine concentric lines. Back covered with prominent elongated tubercles and furrows. Foot narrow. Breathing-hole on the posterior dextral margin of the mantle. Body covered with a thin watery mucus.

Color, usually of various shades of amber, without spots or markings, sometimes blackish; head and tentacles smoky; foot whitish.

Length, 1·0.

This species, according to its author, is nearly allied to the *L. agrestis*, with which it may probably prove to be identical. It is said to be much smaller, and at all ages possesses a peculiar gelatinous or semitransparent consistency. Its tuberosities are very prominent, and it does not secrete a milky mucus at every part of the surface when touched. Like *agrestis*, it is very active in its movements, and suspends itself by a mucous thread.

It is found under decaying wood and stones. It occurs in this State and northwardly, and has been seen in Ohio and Missouri.

(*EXTRA-LIMITAL.*)

L. gracilis. (Ferussac, Mollusques, p. 23.) Mantle fulvous; back brown. *Western States.*

*L.? dorsalis.** (*Philomycus id.* Binney, op. cit. p. 14.) Body attenuated behind. No mantle. Breathing hole very minute, and about an eighth of an inch behind base of the upper tentacle. *Color*, ashen above, with a shade of blue and an interrupted black line along the back. Length, 0·75. *Vermont, Massachusetts.*

* This species undoubtedly exhibits the type of a new genus, but its characters have not yet been defined.

GENUS ARION. *Ferussac.*

With the characters of the preceding, but the breathing-hole more in front. Mantle with small granulations, and containing small calcareous concretions. A terminal mucous pore.

Obs. It is very doubtful whether this should be considered as more than a sub-genus of *Limax*.

Arion hortensis.

Limax hortensis. Lamarck, An. sans vert. ed. Brux. Vol. 3, p. 265.
Arion id. Ferussac, Mollusques, p. 65, pl. 2, fig. 6.
A. id. Binney, Limacidæ, p. 10.

Description. Body narrow, expanding somewhat behind, and ending in a truncated point. Surface above with crowded fine oblong tuberosities; and the flanks with elongated tuberculated plates, with furrows between. Mantle small, oval, flattened, its anterior edge nearly reaching the head. It is about one-fourth of the length of the body. A tubercular ridge, with furrows on each side, between the upper tentacles; lower tentacles very short. Foot separated from the margin of the body by a furrow, and projecting beyond the body behind in a flat and rounded form. The mucous pore is a triangular sinus. Breathing-hole very small, near the edge of the mantle, about one-third of its length distant from its anterior extremity.

Color. Above whitish or ashen, with occasionally a tinge of brown. On each side of the body an obscure brownish line, uniting over the posterior extremity. Upper tentacles darker than the general surface. Foot whitish.

Length, 1·0 and more.

I have followed Mr. Binney in the nomenclature of this species, who appears to consider it as identical with the *hortensis* of Europe, from its black longitudinal bands. Its hitherto restricted locality (vicinity of Boston), and small numbers, seems to induce that distinguished naturalist to consider it as an introduced species.

GENUS TEBENNOPHORUS. *Binney.*

Mantle covering the whole superior surface of the body. Pulmonary cavity anterior; orifice on the right side, towards the head. Vent contiguous to, and a little above and in advance of the pulmonary orifice. Organs of generation united; orifice behind and below the superior tentacle of the right side. No testaceous rudiment, terminal mucous pore, or locomotive band of the foot.

Obs. This genus appears to be allied to the *Onchidium* of Buchanan, but I have had no opportunity to examine the species upon which it is founded. In both, the mantle covers the

whole body. In *Onchidium*, however, the pulmonary cavity is placed towards the middle of the body, with its orifice behind; the organs of generation, moreover, are distant.

Tebennophorus caroliniensis.

PLATE III. FIG. 1.

Limax caroliniensis. Bosc, Buffon, ed. Deterv. Vol 1, p. 80.
L. togata. Gould, Invertebrata of Mass. p. 3.
Tebennophorus caroliniensis. Binney, Limacidæ, p. 11.

Description. Body flattened towards its posterior extremity, which is obtuse. Mantle fleshy, and falling in a slight curve between the two superior tentacles, reaching on the sides to the superior margin of the foot, rounded behind. Surface covered with irregular vermiform glands, assuming a general longitudinal direction, with shallow furrows between. Foot extending a little beyond the mantle behind. Mouth surrounded with a circular row of papillæ. Orifice of the organs of generation on the right side, at a little distance behind and below the superior tentacle. Breathing-hole large, a fourth of an inch behind the origin of the upper tentacle; vent in close contact, a little above and in front of it. Above the breathing-hole, on the back, is a deep curved furrow, running upwards and backwards. Upper tentacle long and stout, ending in a bulb; lower short and conical. Locomotive band not distinguishable from the lower surface of the foot.

Color. Whitish or yellowish white, variegated with clouds and spots of brownish and blackish, so arranged as to form three ill-defined longitudinal bands the whole length of the body, anastomosing more or less with each other, with smaller spots of the same color between them; lower margin white or yellowish. Upper tentacle brownish or blackish. In some specimens the body is irregularly clouded with brownish, or with numerous black spots, or with clouded spots in regular series.

Greatest length when extended, 4·0.

This species was first noticed by Bosc in South-Carolina. It has since been observed in Vermont, Massachusetts, New-York, Ohio and Missouri. According to Mr. Binney, it is very inactive and sluggish. Found under the bark of trees, and appears to be partial to the *Tilia americana*, or *Basswood.*

FAMILY HELICIDÆ.

Body elongated, twisted spirally, and distinct from the foot. Tentacula four, rarely two; the upper bearing the eyes. Shell closed by a fleshy collar. Generative organs united in front. Vent near the breathing orifice. Shell globular, spiral, varying very much in its form, and receiving the body more or less completely.

GENUS VITRINA. *Draparnaud.*

Body slightly spiral, with a fleshy collar surrounding the neck, and produced forward into a sort of shield, and, with other retractile appendices, covering the shell. Foot separated by a slight furrow. Shell very small, thin, transparent, fragile, and flattened, without an umbilicus. Aperture large, but its margin not tumid, and borne on the posterior part alone of the animal.

VITRINA PELLUCIDA.

PLATE III. FIG. 42. A. B. — (STATE COLLECTION.)

Vitrina pellucida. DRAPARN. Hist. des Moll. p. 119, pl. 8, fig. 34–37.
Helico limax. FERUSSAC, Method. Conch. pl. 29; Moll. pl. 9, fig. 6.
Vitrina pellucida. SAY, Long's Expedition, Vol. 2, p. 258.
V. id. ADAMS, Am. Jour. Sc. Vol. 40, p. 274.

Description. Shell minute, ear-shaped, slightly spiral at its summit. Aperture very large. Animal with its breathing and excretory orifices behind. Generative apparatus under the right superior tentaculum.

Color, greenish yellow.

Greatest diameter, 0·25.

In this country, the above species was first detected by Mr. Say, under stones and fallen timber, near Coldwater lake, Lat. 48° 50′ north. It has more recently been found in this State by Mr. Adams, at Rogers's Rock, Lake George.

Through inattention, the figures B. C. on the plate, are erroneously said to be of the natural size.

GENUS HELIX. *Linneus.*

Animal with a head rather distinct, with four retractile tentacula enlarged at the end: a fleshy collar closes completely the orifice of the shell. Foot large, oblong. Generative organs as in the preceding genus. *Shell* very variable in its form, globular, fusiform, conoidal or turreted. Aperture crescent-shaped, simple or toothed, oblique, broader than long. Umbilicus open or concealed. From three to fourteen spiral turns. Usually dextral.

Obs. The species of animals belonging to this group are very numerous, and have all a strong family resemblance. They have been united together by Lamarck into one family, under the name of *Colimacés*. They are so abundant in Europe as to become positively injurious to cultivated plants. They form the basis of a nutritive soup in the south of Europe, much prized by invalids. The best accounts of the American species are to be found in the writings of Say; of Dr. Binney, in the *Boston Journal of Natural History*; of Dr. Gould, and a few others whose names will be cited in the following pages.

Helix albolabris.

PLATE II. FIG. 12.—(STATE COLLECTION.)

Cochlea. virginiana. Lister, Conchology, pl. 47, fig. 45.
Helix albolabris. Say, Nich. Encycloped. Vol. 4, pl. 1, fig. 1. Long's Exped. St. Peter, Vol. 2, p. 258. Am. Conch. pl. 13.
H. id. Ferussac, Hist. des Mollusques, pl. 43, figs. 1, 3.
H. id. Binney, Bost. Jour. Nat. Hist. Vol. 2, p. 476, pl. 13.
H. id. Jay, Catalogue of Shells. p. 43. Adams, Am. Jour. Vol. 40, p. 272.
H. id. Wheatley, Cat. Shells of United States, p. 17.

Description. Shell orbicular, subconvex. Whorls five to six, rounded, with numerous minute oblong striæ, crossed by exceedingly minute revolving lines. Aperture contracted by the lip, which is abruptly and widely reflected. Umbilicus of the mature shell covered by the reflected lip, which is continued to the base of the shell. In the young, the umbilicus is open, and the lip not reflected. Spire slightly elevated. Suture distinct.

Color. Almost uniformly of a yellowish brown, occasionally with a pinkish hue. Lip white. The animal varying from white to cream-color; its back with glandular tubercles. Foot pointed behind, and its length twice the diameter of the shell.

Transverse diameter of shell, 1·0 – 1·3.

This is one of our largest and most common shells, occurring in moist and shady places in every part of the Union. According to Dr. Gould, they deposit their eggs (which are white, opake and elastic, and varying from thirty to eighty in number) in the month of June. They are placed in light mould by the side of rocks and logs. In about twenty or thirty days, the young animal issues forth with a shell containing one whorl and a half. In October they cease to feed, and hiding themselves under a log or stone, with the aperture upward, close it by secreting a thin membrane. In this state they remain torpid during the winter.

Common as this species is, and long as it has been known, I find no allusion to it in the last edition of Lamarck. The name *albolabris* of Daudebert, figures as a variety? of *H. bonplandi* of Lamarck, which is a very different shell.

Helix appressa.

PLATE II. FIG. 11. A. B.—(STATE COLLECTION.)

Helix appressa. Say, Nich. Encyclopedia; Jour. Acad. Nat. Sciences, Vol. 2, p. 151.
H. linguifera. Ferussac, Tab. systematique, p. 33.
H. linguifère. Lamarck, Am. sans vert. Ed. Brux. Vol. 3, p. 293.
H. appressa. Binney, Bost. Jour. Nat. Sciences, Vol. 3, p. 356, pl. 8.

Description. Shell orbicular, depressed; base flattened or slightly convex. Whorls five, depressed, forming an angle on the external one, more acute near the superior angle of the lip, with numerous transverse elevated equidistant lines with interstitial grooves. Umbilicus covered with calcareous matter, but concave within. Aperture rather restricted. Lip dilated, reflected, adpressed near the base to the body-whorl, and covering the umbilicus. A slight tooth-like angle on the lower part of the outer lip. Pillar-lip with a strong, prominent, compressed, oblique white tooth, gradually becoming obsolete towards the umbilicus.

Color. Epidermis uniform brownish horn-color; the lip white, edged with dusky brown. Animal with the neck and the sides blackish.

Diameter, 0·5 – 0·8.

This species appears to exist from the western part of this State southwardly. It has been noticed in Alabama. The lip has occasionally two projecting angles. Somewhat allied to *tridentata*, but the umbilicus is covered. According to Mr. Binney, this species and *palliata*, although very unlike, yet their varieties approach each other by nice and scarcely appreciable differences, until they at length seem to blend into one. I am not aware that it has been found north or east of this State.

Helix exoleta.

PLATE II. FIG. 6. A. B. — (STATE COLLECTION.)

H. albolabris, var. *unidentata.* Ferussac, Moll. pl. 46, A. fig. 6.
H. zaleta. Say, MSS. as cited by Binney, Bost. Journ. Nat. Hist. Vol. 1, p. 492, pl. 20.
H. exoleta. Binney, in literis.

Description. Shell convex, somewhat ventricose. Whorls five or six, with minute oblique striæ. Suture distinct. Lip white, broadly reflected. Umbilicus covered. Pillar-lip with a prominent oblique tooth.

Color. Epidermis of a uniform yellowish horn-color. Tooth white. Animal greyish brown or blackish above, and three inches in length.

Diameter of the shell, 1·0. Height, 0·6.

I am indebted to Mr. I. Cozzens for specimens of this species from the banks of the Hudson river, Rockland county. It ranges through the Western States.

Helix tridentata.

PLATE II. FIG. 7. A. B. — (STATE COLLECTION.)

Helix tridentata. Say, Nich. Ency. Am. Ed. Vol. 4, pl. 2, fig. 1.
H. id. Ferussac, Hist. des Moll. pl. 51, fig. 3.
Helice tridentée. Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 309.
H. id. Binney, Bost. Journ. Nat. Hist. Vol. 3, pl. 22, fig. 1.
H. id. Gould, Invertebrata of Mass. p. 173.

Description. Shell depressed, with the spire but little elevated. Whorls five to six, slightly convex, and crossed obliquely by numerous minute elevated lines. Aperture contracted, trilobate by three curves on the outer lip, which, at their junction, form two small acute teeth; a third slightly curved and transverse tooth on the pillar-lip. Outer lip broad, reflected. Umbilicus large, deep, and partially covered by the reflected outer lip.

Color. Epidermis brownish horn-color. Animal dark bluish slate; deeper on the head, back and tentacles. Foot nearly twice as long as the diameter of the shell.

Diameter, 0·5 – 0·7.

This species is found from Massachusetts to Missouri, and along the Atlantic to Florida. It is common in many parts of this State.

Mr. Binney supposes the *H. fallax* of Say to belong to this species. The description of *fallax* shows it indeed to be closely allied to that species, but, as we think, with sufficient distinctive characters.

Helix fallax.

PLATE III. FIG. 23. A. B. — (STATE COLLECTION.)

Helix fallax. Say, Journ. Acad. Nat. Sc. Vol. 65, p. 119.
H. tridentata, var. Binney, Bost. Jour. Nat. Hist. Vol. 3.

Description. Spire elevated, convex, often decorticated. Whorls five to six, with elevated lines. Lip reflected, with a deep stricture behind nearly closing the aperture, bidentate. Teeth separated by a profound sinus: upper tooth reflected into the mouth; lower tooth placed near the base. Pillar-lip with a large subtriangular lamelliform tooth curving downwards. Umbilicus open, exhibiting all the volutions.

Color. Epidermis yellowish horn-color; reflected portion of the lip white.

Diameter, 0·5. Height, 0·3.

The chief distinctive characters of this species are to be found in its smaller size, more elevated spire, more contracted aperture, and the peculiar shape of the tooth on the pillar-lip. It is found from New-York to South Carolina. The Carolina specimens, according to Mr. Say, are as large as *H. tridentata.*

Helix thyroidus.

PLATE II. FIG. 8. A. B. Immature. — (STATE COLLECTION.)

Cochlea umbilicata. Lister, Conch. pl. 91, fig. 91.
Helix thyroidus. Say, Nich. Encyc. Vol. 4. Id. Acad. Nat. Sc. Vol. 2, p. 161.
H. id. Id. American Conchology, pl. 13, fig. 1.
H. id. Ferussac, Histoire des Mollusques, pl. 49, A. fig. 4.
H. thyroidienne. Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 309.
H. thyroidus. Gould, Invertebrata of Mass. p. 171.

Description. Shell rounded, convex. Whorls convex, about five in number, with minute parallel oblique striæ; the suture distinctly impressed. Aperture moderately large, lunate. Lip broadly reflected, and partially covering the umbilicus. Pillar-lip in the adult with an oblique tooth. Umbilicus exhibiting one volution, and sometimes entirely closed.

Color. Epidermis yellowish brown. Animal granulated, and of a soiled yellow.

Diameter, 0·5 – 0·8.

We have strongly marked varieties in this vicinity of a light chocolate-brown, with dispersed dark spots, and interrupted revolving lines; the pillar-lip smooth; diameter 0·8; animal of a light amber-color. I have thought that it would be more instructive to give this variety in the plate above referred to, than the typical form, which may be found in most of our conchological works.

This species is common in moist shady places, from New-York to Missouri. It is more rare in the Eastern States.

Helix alternata.

PLATE II. FIG. 9. — (STATE COLLECTION.)

Helix alternata. Say, Nich. Ency. Vol. 4, pl. 1, fig. 2. Id. Jour. Acad. Nat. Sc. Vol. 2, p. 161.
H. scabra. Lamarck, An. sans verteb. Ed. Brux. Vol. 3, p. 292
H. alternata. Gould, Invertebrata of Mass. p. 177. Adams, Am. Jour. Vol. 40, p. 273.

Description. Somewhat depressed, slightly convex above. Whorls five or six, flattened, and roughened above with lines of growth; smooth beneath. In young specimens, there is a prominent ridge between the upper and under surfaces. Lip simple, thin and brittle, and regularly curved. Umbilicus wide and deep, exhibiting all the volutions.

Color. Epidermis dusky. Shell light brown, alternating or varied with zigzag bars of deep reddish brown, becoming smaller as they converge towards the umbilicus. These bars are interrupted by a light colored revolving band. Lip within glossy and pearly. *Animal:* Head and tentacles light slate; back brown; remainder of the upper surface brownish orange.

Diameter of the shell, 0·8 – 1·0.

Common every where in ditches and moist places, and under the bark of decaying trees. Its geographical limits southwardly and westwardly not known. It has been observed from Maine to Maryland. As Deshayes has properly observed, the name imposed by Lamarck must be expunged, that of Say having distinctly the priority.

Helix arborea.

PLATE II. FIG. 10. a. b. c.—(STATE COLLECTION.)

Helix arborea. Say, Nich. Ency. Vol. 4, pl. 4, fig. 4.
H. id. Binney, Bost. Jour. Nat. Hist. Vol. 3, pl. 26, fig. 1.
H. id. Gould, Invertebrata of Mass. p. 182, fig. 110.
H. id. Adams, Am. Journal Science, Vol. 40, p. 273.
H. id. Wheatley, Catalogue of Shells of U. S. No. 494, p. 19.

Description. Shell small, thin, fragile, orbicular, pellucid, depressed, very little elevated; concave beneath. Whorls four to five, slightly rounded above, with a distinct suture, and minutely wrinkled irregularly in the direction of the lines of growth; beneath smooth, with a wide and deep umbilicus. Aperture sublunated. Lip simple, thin and brittle, its junction with the body-whorl acute.

Color. Corneous, occasionally deep brown and even blackish. *Animal* with a dusky head and neck, lighter behind.

Diameter, 0·2. Height, 0·13.

The species has a wide geographical range. It has been observed at Troy in this State by Dr. Newcomb, and at Staten island in Rockland county. According to Dr. Gould, it may be confounded with *H. cellaria, indentata, gularis* and *electrina.* It is smaller than the first; has not the distant impressed radiating lines of the second, nor the peculiar tooth within the aperture of the third, and is distinguished from *electrina* by its greater number of whorls and less polished appearance.

Helix electrina.

H. electrina. Gould, Invertebrata of Mass. p. 183, fig. 111.
H. id. Adams, Am. Journ. Science, Vol. 40, p. 273.

Description. Shell small, orbicular, depressed, conical, pellucid, fragile, and the lowest whorl suddenly enlarging as in *H. indentata.* Whorls four, conspicuously wrinkled by the lines of growth. Lip moderately thick and shining; its outline nearly a direct section of the whorl. Umbilicus moderate, smaller than in the preceding. Aperture rounded. *Color,* amber.

Diameter, 0·2. Height, 0·13.

Dr. Gould, to whom we are indebted for this species, speaks of it as resembling *indentata* above and *arborea* beneath. It is certainly very closely allied to both. It has been noticed in Massachusetts and Missouri. I have not seen it, but Dr. Newcomb has found it near Lake George in this State.

Helix indentata.

PEATE III. FIG. 26. A. B. — (STATE COLLECTION.)

Helix indentata. Say, Acad. Nat. Sciences, Vol. 2, p. 372.
H id. Binney, Journ. Nat. History, Vol. 3, pl. 29, fig. 1.
H id. Gould, Invertebrata of Mass. p. 181, fig. 109.

Description. Shell small, depressed, highly polished, subiridescent, pellucid, very fragile. Whorls four, slightly convex, with regular subequidistant impressed transverse lines, with the intervening spaces very smooth; from twenty-eight to thirty of these lines on the body-whorl, extending to the umbilicus. Suture not deeply indented. Aperture moderate. Lip simple, terminating at its lower extremity at the centre of the base of the shell. Umbilical region deeply indented, but not perforated.

Color. Polished light horn-color: the animal bluish black above; immaculate, lighter behind.

Diameter of the shell, 0·15 – 0·22. Height, 0·07 – 1·09.

This species is found, like the preceding, about decaying logs and fallen timber. In some specimens the umbilicus is open and patulous, and the animal of a light blue color. It has been observed from Vermont to Ohio. In this State it was found by Mr. Newcomb in the neighborhood of Troy.

Helix clausa.

PLATE II. FIG. 13. A. B. — (STATE COLLECTION.)

Helix clausa. Say, Acad. Nat. Sciences, Vol. 2, p. 154. Id. Am. Conchology pl. 37.
H. id. Binney, Bost. Jour. Nat. Hist. Vol. 1, p. 482, pl. 15.

Description. Shell fragile, somewhat elevated, subglobular, slightly perforated. Whorls four to five, convex, with minute oblique striæ. Aperture somewhat contracted. Lip reflected, flat, nearly covering the umbilicus, and occasionally entirely so, but not dilated there as in *albolabris.*

Color. Yellowish brown or russet; the animal dusky black.

Diameter, 0·5 – 0·7. Height, 0·5.

This species is allied to *albolabris,* but is not much more than half its size. It may be considered as a southern species, extending to New-Jersey and New-York.

Helix subglobosa.

PLATE II. FIG. 14, A. B.; AND PLATE III. FIG. 39, A. B.—(STATE COLLECTION.)

H. subglobosa. Binney, Jour. Nat. History, Vol. 1, p. 485, pl. 17.
H. hortensis. Gould, Invertebrata of Mass, p. 172.

Description. Shell elevated, subglobose, imperforate. Umbilical region indented. Whorls five, rounded, with numerous transverse striæ. Suture distinctly impressed. Apex somewhat elevated. Aperture lunate; its upper margin embracing nearly half of the penultimate whorl. Lip simple, but everted above until it reaches the plane of the umbilical region, where it becomes reflected throughout the remainder of its extent, being duplicated on the umbilicus. Base convex.

Color. Light waxen, with five to six dark rufous revolving lines on the body-whorl. In those with six lines, the line above the lowest is very broad; the succeeding one above becomes effaced in the suture, so that only two are obvious on the whorl above. In specimens with but five revolving lines, three narrow bands may be traced on the second whorl; these lines are evident on the inner side of the outer lip. In dead shells, the waxen parts become white, and the revolving rufous lines become nearly effaced. There are varieties entirely destitute of the revolving bands. The animal has the head and neck blackish, slightly tinged with brown; base of the foot black, the tip soiled flesh-color. Breathing-hole surrounded by a dark circle.

Diameter, 0·8 – 0·85. Height, 0·5 – 0·6.

I am indebted to Col. Totten of the United States Engineers, for my acquaintance with this species, which he found near the shores of the St. Lawrence, two hundred miles below Quebec. As it was certainly new to this country, I described it in my notes several years ago under a distinct name, which it is now unnecessary to quote. Mr. Binney, who published the first description of the species under the name of *subglobosa*, had only the variety destitute of bands. Its resemblance to the European *nemoralis*, but more particularly to *hortensis*, is very striking, but the spire is not so acute. As far as is yet known, it seems to be restricted to the neighborhood of the sea; a fact which I am far from supposing to afford corroborative proof of its being a European species. It has been noticed near Portland in Maine, and at Cape Cod in Massachusetts. I have not yet found it in this State, but I have reason to believe that it may be found along our maritime border. I understand that Mr. Binney concurs with Dr. Gould in believing it to be identical with the *hortensis* of Europe.

Helix concava.

PLATE II. FIG. 15. A. B. — (STATE COLLECTION.)

Helix concava. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 159.
H. id. Wheatley, Cat. Shells U. S. No. 492, p. 19.

Description. Shell much depressed, orbicular. Whorls five, irregularly wrinkled across, and more convex beneath. Suture distinctly impressed. Lip simple, very slightly reflexed towards the base. Aperture large but short, in the line of the axis of the shell. Umbilicus large, funnel-shaped, exhibiting distinctly all the volutions (which are there very prominently corrugated) to the summit.

Color. Light corneous, or whitish with a tinge of yellowish green, immaculate.

Diameter, 0·7. Height, 0·35.

Of this remarkably distinct species, I have received specimens from the western district of this State, and from the neighborhood of Lake Champlain. It does not appear in Gould's Catalogue of the Shells of Massachusetts. Mr. Wheatley, however, assigns its locality in the Eastern States. To the west it seems to be more numerous, and has been noticed in Ohio and Missouri.

Helix palliata.

PLATE III. FIG. 36. A. B. PLATE II. FIG. 16. A. B. Variety. — (STATE COLLECTION.)

Helix palliata. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 152.
H. obstricta. Id. Journ. Acad. Nat. Sciences, Vol. 2, p. 154.
H. denotata. Ferussac, Histoire des Moll. Pl. 49, A. fig. 5.
H. carolinensis. Lea, Am. Phil. Trans. Vol. 4, p. 102, pl. 15, fig. 33.
Carocolla helicoides. Id. Am. Phil. Trans. Vol. 4, p. 159, pl. 15, fig. 31.
H. palliata. Binney, Journ. Nat. Hist. Vol. 3, p. 353.
Helice notable. Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 309.

Description. Shell subdepressed or depressed, with elevated revolving and minute transverse lines, and numerous minute tubercles with scattering stiff hairs. Whorls five, very slightly convex above, distinctly convex beneath, and forming in one variety (Pl. 2, fig. 16, b.) an obtuse angle, appearing like a prolongation of the broadly reflected lip. Aperture usually trilobed. Umbilical region covered with a white callus. Lip widely reflected, with two obtuse sinuses on each side, forming a prominent tooth between them, and a third profound sinus near the middle of the lip; occasionally a single tooth on the outer lip. Pillar with a large white oblique tooth.

Color. Reddish brown; reflected portion of the lip white, tinged occasionally with blue.

Diameter, 0·7 – 0·9. Height, 0·5.

Var. A. With a prominent acute carina, and destitute of protuberances (Pl. 2, fig. 16). This forms the *Carocolla helicoides* of Lea, cited above.

Var. B. Also carinate, but with a smooth epidermis, and a single tooth on the outer lip. *H. obstricta* of Say. *Western States.*

Var. C. Carinate; the oblique striæ widely separated and distant. *H. carolinensis* of the same author.

As far as I have had opportunities for the examination of this remarkable species, its northernmost limits do not appear to extend beyond this State. It has been found at Niagara, near Troy, and in the neighborhood of New York. According to Dr. Eights of Albany, this species appears to affect more especially the Limestone region. In the latest European conchological works, this species figures under the name of *denotata*, which was applied to it by Ferussac, without being aware of Say's previous description. I entirely concur with Mr. Binney in the synonimes of this species, although I have had no opportunity of making a personal examination of all the varieties.

Helix dentifera.

PLATE II. FIG. 17. A. B — (STATE COLLECTION.)

Helix dentifera. Binney, Jour. Nat. Hist. Vol. 1, p. 494, pl. 21.

Description. Shell subglobose, somewhat flattened. Spire depressed. Whorls five, convex, with numerous minute oblique striæ. Suture distinct. Lip broadly and abruptly reflected, occasionally with a slight process near its lower margin. Pillar-lip with an oblique prominent tooth, nearly parallel with the upper margin of the aperture. Umbilicus closed by the broadly reflected outer lip.

Color. Epidermis yellowish horn, immaculate. Tooth white. Animal brownish above, greyish on the sides.

Diameter, 0·7. Height, 0·3.

This species was first described by Mr. Binney from Vermont. It does not appear in the most recent list of the shells of Massachusetts. It seems to be a rare species, but will in all probability be detected in this and the adjoining eastern States.

Helix diodonta.

PLATE II. FIG. 18. A. B. — (STATE COLLECTION.)

Helix diodonta. Say, Long's Exped. St. Peters, Vol. 2, p. 257, pl. 15, fig. 4.
H. id. Wheatley, Cat. of Shells of the U. S. No. 470.

Description. Shell moderately large, somewhat depressed. Spire convex, very little elevated. Whorls five, regularly and prominently wrinkled and grooved transversely. Aperture moderate regular. Lip moderately reflected, with a slightly projecting tooth-like callus near

the base on the inner edge. Pillar-lip with a short oblique tooth on the middle portion. Umbilicus large and deep, exhibiting all the volutions. This is very indistinctly given in the figure A.

Color. Pale horn-color; reflected portion of the lip and the tooth white.

Diameter, 0·7 – 0·9. Height, 0·4 – 0·5.

This species is somewhat allied to *H. profunda*, but is distinguished by its armed pillar-lip; in its delicate texture, it resembles *multilineata*. According to Mr. Wheatley, it is found from Maine to Ohio.

Helix monodon.

PLATE III. FIG. 19. PLATE III. FIG. 21. A. B.

Helix monodon. Racket, Tr. Lin. Soc. Lond. Vol. 13, p. 42, pl. 5, fig. 2.
H. fraterna. Say, Long's Exped. St. Peter's, Vol. 2, p. 257, pl. 15, fig. 3.
H. convexa. Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 408.
H. fraterna. Adams, Am. Jour. Sc. Vol. 40, p. 272.
H. monodon and *fraterna.* Binney, Jour. Nat. Hist. Vol. 3, pp. 360, 363, pl. 10, figs. 1, 2.
H. monodon. Gould, Invertebrata of Mass. p. 174, fig. 113.

Description. Shell slightly convex, subdepressed, and covered with a hairy epidermis. Whorls five or six, narrow, diminishing very gradually in width to the apex. Aperture semilunar, restricted and closed by a deep groove behind the reflected portion of the outer lip. The umbilicus either deep, but not exhibiting all the volutions as in fig. 21; or partially or entirely closed by the reflected lip. The outer edge of the lip not projecting beyond the surface of the whorl. Base rounded, much excavated in the umbilical region. Pillar-lip with an oblique compressed elongated white tooth.

Color. Epidermis dusky brownish or chesnut-colored; reflected portion of the outer lip occasionally with a pinkish hue. Animal yellowish brown, darker in front.

Diameter, 0·3 – 0·5.

This species was originally described by Mr. Racket in the English Linnean Transactions, with an open umbilicus. Mr. Say described the same under the name of *fraterna*, with a closed umbilicus. Both are now believed to be identical.

Found on rotten wood in forests, or in open fields under stones: a pair usually found together. It appears to extend through the Northern and Western States. It has been found at Troy, and throughout the western district of this State. It seems to be allied to *H. hirsuta*, but the tooth is much smaller than in that species, which is moreover imperforate.

Helix hirsuta.

PLATE III. FIG. 37. a. b.—(STATE COLLECTION.)

Helix hirsuta. Say, Journ. Acad. Nat. Sc. Vol. 1, p. 17.
H. id. Binney, Journ. Nat. Hist. Vol. 3, p. 365, pl. 10, fig. 3.
H. id. Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 308.
H. id. Gould, Invertebrata of Mass. p. 175, fig. 116.

Description. Shell rather small, subglobose. Whorls five, slightly rounded, and covered with numerous short rigid hairs. Suture distinct. Aperture very narrow, almost closed by an elongated lamelliform tooth on the pillar-lip, which extends nearly from the middle of the base to the junction of the outer lip with the body-whorl. Lip much depressed and reflected back on the outer whorl, and nearly incorporated with it, with a deep fissure near the centre of the inner margin. Often a small tooth-like projection about the centre of the margin of the outer lip.

Color. Epidermis brownish. Animal whitish; head and tentacles slate-colored.

Diameter of shell, 0·3.

This species is common in this State, and is very abundant throughout the Western States. In cabinet specimens, it is often found divested of its hairy epidermis. It can scarcely be confounded with any other species.

Helix elevata.

PLATE III. FIG. 20. a. b.—(STATE COLLECTION.)

Helix elevata. Say, Jour. Acad. Nat. Sc. Vol. 2, p. 154.
H. knoxvilliana. Id. American Conchology, plate 37.
H. elevata. Binney, Jour. Nat. Hist. Vol. 1, p. 191, pl. 19.

Description. Shell large, convex, elevated, almost conical. Whorls nearly seven, somewhat convex, with minute oblique striæ. Lip reflected, more broadly so towards its lower inner margin, which is somewhat thickened. Umbilicus none. Pillar-lip with a stout white obliquely curved tooth.

Color. Yellowish horn; reflected edge of the lip and the tooth white. Animal ash-brown above.

Diameter of the shell, 0·9. Height, 0·6.

This species, which is rather common in the Western States, has likewise been observed in Pennsylvania. I have not succeeded in detecting it in this State, but it will probably be found in the western district.

Helix fuliginosa.

PLATE III. FIG. 22.

H. fuliginosa, Griffith. Adams, Am. Jour. Sc. Vol. 40, p. 273.

Description. Shell large, pellucid, polished, little elevated. Volutions slightly convex. Lip simple. Umbilicus open, broad, profound; its margin furrowed by the tranverse wrinkles, which become effaced towards the periphery of the body-whorl. Aperture large, simple, semilunate.

Color. Light waxen, polished, with greenish tinge; interior of the mouth rosaceous.

Diameter, 1·0.

This species has been detected near Troy in this State, by Dr. Newcomb. It is allied to the following species, from which, however, I suppose it to differ constantly in size.

Helix cellaria.

PLATE III. FIG. 25 A. B.—(STATE COLLECTION.)

Helix cellaria. Muller, Verm. Hist. No. 130.
H. glaphyra. Say, Nich. Ency. Ed. Am. Vol. 4, pl. 1, fig. 3.
H. nitida. Draparnaud, Moll. pl. 8, fig. 23 to 25.
H. cellaria. Binney, Bost. Jour. Nat. Hist. Vol. 3, pl. 26, fig. 2.
H. id. Gould, Invertebrata of Mass. p. 180, fig. 104.

Description. Shell moderately small, orbicular, depressed, concave beneath, thin, fragile, smoothly polished. Whorls five, slightly convex, with irregular obsolete transverse wrinkles. The umbilicus moderate, gradually enlarging towards the circumference of the body-whorl. Lip simple, thin, acute and regular. Aperture lunate, broader than high.

Color. Waxen or whitish, polished, slightly tinged with greenish, with deeper colored vertical striæ; within the aperture, purplish. Animal light indigo-blue above, darkest on the head; collar greenish.

Diameter of the shell, 0·3 – 0·5.

This animal is now supposed, by the most recent American conchological writers, to be identical with the *cellaria* of Müller, and to have been introduced about water-casks, greenhouse plants, etc. It is often confounded with *inornata* of Say, in the immature state of the latter species, when the umbilicus is but small.

Helix suppressa.

PLATE III. FIG. 24. A. B.

Helix suppressa. Say, Des. ter. and fluv. shells, p. 14.

Description. Shell small, subglobose, depressed, polished, somewhat pellucid. Volutions six in number, wrinkled. Spire convex. Aperture sublunate, narrower beneath. A single prominent tooth within, near the base and distant from the margin. Pillar-lip smooth, simple. Umbilicus small and deep; the umbilical region indented.

Color. Pale horn; the body-whorl opake; whitish near the aperture.

Diameter, 0·2.

This species occurs throughout New-York and Pennsylvania. It has the habit of *H. ligera*, except in size and armature. It is also frequently confounded with *H. gularis*, which it resembles very much both in size and external characters. It differs, however, in its armature.

Helix intertexta.

PLATE III. FIG. 29. — (STATE COLLECTION.)

Description. Shell moderately large, orbicular, subconic, thin. Apex elevated. Lip simple. Umbilicus narrow, but open to the apex, the basal margin being folded over so as to cover partially the entrance. Volutions five, subrounded, rather flattened; apicial whorl smooth; all the others with numerous equidistant striæ, which are also impressed on the interior. Body-whorl obtusely carinate in the upper third of its centre, near the junction of the outer lip, but becoming effaced and almost obsolete on the margin of the outer lip. Suture deeply impressed.

Color. Chesnut-brown externally, purplish within; a light colored revolving line on the upper third of the body-whorl, and is lost in the suture.

Diameter, 0·4. Height, 0·31.

This species I derived from Dr. Newcomb, who obtained it from Manchester, Ontario county, and also from moist woody places in Wayne county. It was labelled "*intertexta*, Gould;" which name I have retained. It appears to be a very distinct species, although from its markings it may prove to be the young of *H. solitaria;* but that species has a wide umbilicus. It is allied in the form and covering of the umbilicus to *H. inornata*, but differs in the angle of the outer lip with the body-whorl.

Helix inornata.

(STATE COLLECTION.)

Helix inornata. Say, Jour. Acad. Nat. Sci. Vol. 2, p. 371.

Description. Shell thin, subglobose, polished; resembling, in its texture and external configuration, *H. cellaria.* The whorls rounded, with numerous transverse wrinkles Spire convex, little elevated. Suture distinct, but not deeply impressed. Umbilicus small, profound. Lip simple, somewhat thickened near the base, slightly everted at that place over the umbilicus. Pillar-lip smooth, polished. Aperture lunate, wider than high.

Color. Pale yellowish horn-color, polished.

Diameter, 0·5 – 0·7. Height, 0·3.

This species has been obtained from Orange and Rockland counties in this State, and is also found throughout the western district. It extends throughout the Western States, but does not appear farther north than this State. According to Say, it is closely allied to *ligera*, but is larger and not as solid, and the aperture is proportionally wider.

Helix labyrinthica.

PLATE III. FIG. 31. — (STATE COLLECTION.)

Helix labyrinthica. Say, Nich. Ency, Vol. 4; Jour. Acad. Nat. Sci. Vol. 1, p. 124.
H. id. Binney, Bost. Jour. Nat. Hist. Vol. 3, pl. 24, fig. 1.
H. id. Gould, Invertebrata of Mass. p. 184, fig. 106.

Description. Shell very small, conoidal; the apex obtuse. Whorls six, rapidly decreasing to the apex, with distinct elevated equidistant oblique lines. Suture distinct. Outer lip somewhat reflected, rounded. Pillar-lip with a long tooth-like ridge (and sometimes beneath it a second one), which appears to revolve within the shell parallel to the suture. The second ridge, when present, terminates before it reaches a point on the pillar-lip, opposite to the outer margin of the lip. Shell flat beneath, with the umbilical region excavated and the umbilicus small.

Color, varying from reddish brown to brownish horn-color. Outer lip often rose-colored. *Animal:* Head slate-colored above; foot white, linear; tentacles dark colored.

Diameter, 0·1. Height, 0·1.

Found on fungus in decaying wood, or under logs and among decaying leaves. It is easily distinguished by its strongly corrugated surface, and the internal ridge or ridges on the pillar-lip. Ranges from Massachusetts, and perhaps farther north, to Missouri. In this State it has been found near Troy, and in the neighborhood of New-York.

Helix ligera.

PLATE III. FIG. 32. A. B.—(STATE COLLECTION.)

Helix ligera? Say, Jour. Acad. Nat. Sci. Vol. 2, p. 157.

Description. Shell subglobose, polished; the body-whorl pellucid. Spire somewhat elevated. Volutions five to six, with minute transverse wrinkles; the apex smooth. Umbilicus moderately large. Lip simple, not reflected, but slightly everted at its lower margin so as partially to cover the umbilicus. Suture distinct. Aperture lunate, broader than high.

Color. Light yellowish; darker on and within the aperture.

Diameter, 0·5 – 0·6. Height, 0·3 – 0·4.

This species, which I noticed in Ontario county, varies very much in size, the smallest not exceeding two-tenths of an inch in diameter. The everted lip, and the large umbilicus, would seem to indicate a distinct species from that to which I have referred it. It may, however, remain provisionally here. It was found in low meadows.

Helix minuta.

PLATE III. FIG. 33. A. B.—(STATE COLLECTION.)

Helix minuta. Say, Nich. Ency. No. 7. Acad. Nat. Sc. Vol. 1, p. 123.
H. pulchella. Binney, Bost. Jour. Nat. Hist. Vol. 3, pl. 13.
H. id. Gould, Invertebrata of Mass. p. 176, fig. 102 (excl. syn.).
H. id. Adams, Am. Jour. Science, Vol. 41, p. 272.

Description. Shell very minute, polished, depressed. Whorls three or four, with faint transverse wrinkles. Suture deeply impressed. Umbilicus large, exhibiting all the volutions. Aperture nearly orbicular. Lip thickened and reflected, not approaching beneath the umbilicus.

Color. Whitish or light horn-color, or opake white. Animal pale-colored.

Diameter, 0·08 – 0·1. Height, 0·05.

Under the bark of trees, and among rotten wood; extending from Massachusetts to Missouri. It is thought by some of our eminent conchologists to be identical with the European *pulchella* of Müller, notwithstanding the sharp parallel ribs which characterize that species. As I view it, I shall consider it as exclusively an American species. The specimen which furnished the figure was obtained from Crownpoint, Essex county.

Helix multilineata.

PLATE III. FIG. 34. A. B.—(STATE COLLECTION.)

Helix multilineata. Say, Jour. Acad. Nat. Sciences, Vol. 2, 156.

Description. Shell large, thin, convex, imperforate. Whorls six, with elevated subequidistant lines separated by grooves. Aperture lunated, not angulated at the base of the column, but obtusely curved. Lip contracting slightly the aperture, reflected, white, and adpressed to the body-whorl near the base. Umbilicus covered with a white callus.

Color. Dark brown, with numerous dark red revolving lines varying from four or five to twenty-five or thirty, sometimes confluent into bands which are minutely and irregularly undulated. Animal granulated; granulæ large, whitish, the interstices blackish. Foot blackish beneath.

Diameter, 0·8 – 1·1. Height, 0·5 – 0·8.

This animal was observed by Say in Illinois and Missouri, where it is exceedingly numerous. The specimen which furnished the figure was said to have been found in the western district of this State, but the precise locality was not indicated.

Helix pennsylvanica.

PLATE III. FIG. 35. A. B.—(STATE COLLECTION.)

Helix pennsylvanica. Green, Journ. Maclurian Lyceum, No. 1, p. 8.
H. id. Binney, Bost. Journ. Nat. Hist. Vol. I, p. 483, pl. 16.

Description. Shell moderately large, convex, elevated, imperforate. Whorls five or six, rounded, with numerous oblique striæ. Suture distinctly impressed. Lip reflected, with occasionally a thickening near the base. Aperture oblique, subtriangular. Umbilicus closed, with its region somewhat indented.

Color. Reddish or dark reddish brown; lip white.

Diameter, 0·8. Height, 0·6.

This species occurs throughout the Western States. It has been found in Pennsylvania, and will probably be discovered in the western district of this State.

Helix perspectiva.

PLATE III. FIG. 38. A. B. — (STATE COLLECTION.)

Helix perspectiva. Say, Journal Academy Nat. Sciences, Vol. 1, p. 18.
H. id. Id. Long's Exped. St. Peters, Vol. 2, p. 258.

Description. Shell small, orbicular, very much depressed. Whorls six, transversely striated, with raised parallel acute lines, forming strongly impressed furrows between them. Umbilicus very large, resembling an inverted spire; in diameter equalling nearly the breadth of the body-whorl, and exhibiting distinctly all the volutions.

Color. Yellowish, sometimes tinged with rufous.

Diameter, 0·3, Height, 0·1.

Common in moist places, in the western district of the State. Found originally by Lesueur near Lake Erie. Through inattention, the magnified figures B. C. are said to be of the natural size.

Helix profunda.

PLATE III FIG. 37. A. B. C. — (STATE COLLECTION)

Helix profunda. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 160.
H. richardi. Ferussac, Hist. des Moll. pl. 70, fig. 4.
H. profunda. Say, American Conchology, pl. 37.

Description. Shell moderately large, convex, regularly ascending to the slightly elevated spire. Whorls five, regularly rounded, with deeply impressed oblique wrinkles. Aperture oblique, dilated. Lip reflected and (except near the superior angle) flat, with a slightly projecting tooth-like callus on the inner edge towards the base. Umbilicus large, profound, and exhibiting all the volutions; base somewhat excavated. The lower margin of the lip is almost reflected over the umbilicus.

Color. Uniform pale corneous or light ashen grey; or more frequently a revolving rufous line on the body-whorl, which is almost concealed upon the spire by the suture, but which passes for a short distance above the aperture. Lip white on its reflected edge.

Diameter, 0·9. Height, 0·6.

Var. A. with many rufous lines.

This species was sent to me from the western part of the State. It occurs also in Ohio and Missouri.

Helix striatella.

PLATE III. FIG. 40. A. B. C. — (STATE COLLECTION)

Helix striatella. Anthony, Journ. Nat. Hist. Vol. 3, p. 298, pl. 3, fig. 2.
H. ruderata? Studer. Adams, Amer. Jour. Science, Vol. 40, p. 273 and 408.
H striatella. Gould, Invertebrata of Mass. p. 178, fig. 112.

Description. Shell small, orbicular, polished, thin, much depressed; the spire somewhat elevated. Whorls four to five, flattened above, rounded beneath, with a distinctly impressed suture, minutely but distinctly marked with elevated sharp lines, which are most obvious on the circumference of the shell; these become obsolete on the whorls near the apex. Aperture oblique, rounded. Base excavated, passing into a broad and deep umbilicus. Lip thin and simple.

Color. Uniform transparent horn, or yellowish or reddish brown. Animal with bluish black tentacles; margin and posterior part of the foot white; foot transparent, terminating acutely behind.

Diameter at the aperture, 0·2. Height, 0·1.

This beautiful little species has for a long time been considered as identical with the *H. perspectiva* of Say. It is, however, a smaller and more delicate shell; the ridges are more conspicuous, and it has fewer whorls.

It has been found near Oriskany and Troy in this State, about old timber and under the bark of rotten trees. Its hitherto ascertained geographical range is from Vermont through Ohio.

Helix solitaria.

PLATE III. FIG. 41. A. B. — (STATE COLLECTION.)

Helix solitaria. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 157.

Description. Shell large, solid, subglobose. Spire conic-convex. Volutions five and a half, wrinkled across and rounded: suture rather deeply impressed. Aperture wide, embracing rather a small portion of the penultimate whorl. Lip simple, not reflected. Umbilicus large, exhibiting distinctly all the volutions.

Color. Reddish horn-color, with two or more revolving dark reddish lines.

Diameter 1·0 – 1·3. Height, 0·7.

This species was first designated by Mr. Say, who noticed it in Missouri. It has since been found, as I am informed, in Ohio. The specimen which furnished the figure was said to have been obtained from Pennsylvania. It may probably be detected in this State.

Helix rufa.

PLATE III. FIG. 30. A. B. — (STATE COLLECTION.)

Description. Shell moderately large, subglobose, thin, with the apex slightly elevated. Whorls five, convex, with numerous distinct oblique lines of growth. Spire somewhat elevated, polished. Suture very distinctly impressed. Lip simple, somewhat thickened beneath, dilated at its junction with the body-whorl, and almost reflected over the umbilicus. Umbilicus moderate, deep.

Color. Uniform reddish brown. Diameter, 0·7. Height, 0·5.

This shell was sent to me from the highlands of Rockland and Orange counties. I referred it originally to the *inornata* of Say; but a reëxamination of the shell has satisfied me that it is specifically distinct, not only in its color, but the elevation of its spire, and the shape of the outer lip.

Helix lineata.

Helix lineata. Say, Nich. Encycl. No. 11. Journ. Acad. Nat. Sc. Vol. 1, p. 18, Vol. 2, p. 373.
H. id. Binney, Bost. Jour. Nat. History, Vol. 3, pl. 29, fig. 3.
H. id. Gould, Invertebrata of Mass. p. 179, fig. 103.

Description. Shell minute, thin and polished, orbicular, very much depressed. Whorls four, flat above, higher than broad, and covered with numerous parallel raised revolving lines. Suture distinctly impressed. Lip simple, with two and occasionally three pair of white conical teeth, visible through the body-whorl. Umbilicus very large and deep, exhibiting all the volutions.

Color. Light greenish, frequently covered with a dusky epidermis. Diameter, 0·2.

This minute species has been noticed from Vermont to Maryland. I have received specimens from the neighborhood of Troy, in this State. It is usually found under stones and leaves, and attached to rotten trees. It has a strong resemblance to a *Planorbis*, and may be, as Dr. Gould suggests, the *P. parallelus* of Say.

Helix chersina.

PLATE XXXV. FIG. 338.

Helix chersina. Say, Journal Acad. Nat. Sciences, Vol. 2, p. 156.
H id. Binney, Bost. Jour. Nat. History, Vol. 3, pl. 24, fig. 6.
H. id. Adams, American Journal Science, Vol. 40, p. 273.
H. id. Gould, Invertebrata of Massachusetts, p. 185, fig. 105.

Description. Shell minute, elevated, conic, pellucid, thin, very smooth and shining. Whorls six, smooth, with a deep suture. Aperture semilunar, narrow, much higher than broad, of about an equal width above and below: lip simple: base convex. Umbilical region indented but closed. *Color.* Smoky horn-color. Diameter, 0·1.

This species has been found from Vermont to Georgia. In this State it has, I learn, also been found, but I am not aware of the precise locality. It occurs under pieces of wood, and among rotten leaves. I have not had an opportunity of examining it, and am indebted to Dr. Gould for the description and figure. It can only be confounded with the *H. labyrinthica;* but its polished surface, and the absence of parallel ridges within its mouth, afford sufficiently distinctive characters.

(*EXTRA-LIMITAL.*)

H. major. (Binney, Bost. Jour. Vol. 1, p. 473, pl. 12.) Whorls six, with coarse oblique raised striæ; revolving striæ indistinct or wanting. *Color*, brownish horn. Diameter, 1·5. *Southern States.*

Closely allied to *albolabris*, and supposed by Ferussac and others to be a southern variety of that species.

H. inflecta. (Say, Ac. Nat. Sc. Vol. 2, p. 153. Binney, Ib. Vol. 3, p. 358, pl. 9, fig. 1.) Aperture trilobate. One or two teeth on the inner margin of the lip. Pillar-lip with a large lamelliform tooth. Umbilicus closed. Epidermis brownish horn, with occasionally fine hair-like projections. Diameter, 0·8. *North-Carolina and the Western States.*

H. irrorata. (Say, l. c. Vol. 2, p. 370. Var. *lactea*, Ferussac.) Shell subglobular, depressed, imperforate. Whorls five; wrinkles on the body-whorl obsolete, more distinct on the spire. Suture declining much near the mouth. Lip reflected, but not flattened. *Color*, pale reddish brown, with numerous white spots, and about four deeper brown obsolete bands. Diameter, 0·6. *Pennsylvania.*

H. corpuloides, Montagu. (Adams, Am. Jour. Vol. 38, p. 193.) *Near Boston.*

H. egena. (Say, l. c. Vol. 5, p. 120.) Shell small, polished, convex. Whorls five, rounded, not distinctly wrinkled. Aperture transverse, rather narrow. Lip simple, its lower margin terminating at the base of the shell. Umbilicus none, but deeply indented. Diameter, 0·1. *Pennsylvania.*

H. mitchelliana. (Lea, Am. Phil. Soc. Vol. 6, p. 87, pl. 23, fig. 71.) Shell above obtusely conical, below inflated, longitudinally and finely striate: whorls five. Lip reflected; aperture nearly round. Imperforate. *Color*, corneous transparent. Diameter, 0·7. *Ohio.* Allied to *jejuna* and *ligera.*

H. porcina. (Say, Exped. to St. Peter's, Vol. 2, p. 257, pl. 15, fig. 2.) Shell small, depressed. Epidermis rugose, with numerous minute bristles. Whorls rather more than four, depressed above, rounded beneath, forming a very obtuse angle rather above the centre of the whorl. Umbilicus open rather small, profound. Lip simple. *Color*, yellowish brown. Diameter, 0·3. *N. W. Territory.*

H. vancouvrensis. (Lea, Am. Phil. Tr. Vol. 6, p. 87, pl. 23, fig. 72.) Shell large, plano-convex, flattened below and shining, longitudinally striate, widely umbilicate. Whorls five, rounded. Lip below somewhat reflexed, above depressed, forming a sinuous edge: columella short, callous. *Color*, corneous. Diameter, 1·1. *Oregon.*

H. interna. (Say, Ac. Nat. Sc. Vol. 2, p. 155.) Whorls 6 – 8, with regular elevated transverse lines, which are obsolete beneath. Spire convex, little elevated. Aperture very straight, the transverse less than one half of the longitudinal diameter. Lip not reflected. Umbilicus obsolete or wanting. Two prominent lamelliform teeth within the lip; the upper largest, and neither attaining the edge of the lip. *Color*, yellowish red. Diameter, 0·3. *Missouri.*

H. nuttaliana. (Lea, Am. Trans. Vol. 6, p. 88, pl. 23, fig. 74.) Shell obtusely conical, large, flattened beneath, umbilicate, minutely striated longitudinally. Whorls seven. Lip somewhat reflected. Aperture nearly round, banded within. Yellowish above, dark brown below; near the carina, banded. Diameter, 1·3. *Oregon.*

H. columbiana. (Id. l. c. Vol. 6, p. 87, pl. 23, fig. 75.) Shell moderately large, obtusely convex, rounded beneath, umbilicate. Whorls six, roundish. Lip white, reflected, slightly callous below. *Color*, corneous, polished, longitudinally striate, transparent. Diameter, 0·7. *Columbia River.*

H. californiensis. (Id. l. c. Vol. 6. p. 99, pl. 23, fig. 79.) Shell moderately large, globose, imperforate, granulated. Whorls five. Lip reflected: columella smooth. *Color*, brownish, with a dark revolving band. Diameter, 0·7. *California.*

H. gularis. (Say, Jour. Acad. Vol. 2, p. 156.) Very small, subglobose, polished, pellucid. Whorls 6 – 7, with prominent wrinkles. Spire convex, a little elevated. Suture moderate. Lip not reflected. Throat bidentate, far within on the side of the lip. Teeth lamelliform, of which one is oblique and near the middle, and the other shorter and near the base. Umbilicus none. *Color*, yellowish horn; beneath opake, whitish yellow. Diameter, 0·3. *Ohio.*

A southern species often confounded with *suppressa.*

H. townsendiana. (Lea, Am. Phil. Tr. Vol. 6, p. 99, pl. 23, fig. 80.) Shell large, obtusely conical, longitudinally striate, rough, umbilicate. Whorls five. Aperture nearly round. Lip reflected; columella smooth. *Color*, brownish. Diameter, 1·0. *Columbia River.*

H. jejuna. (Say, Jour. Acad. Nat. Sc. Vol. 2, p. 158.) Shell small, subglobular, glabrous. Whorls five, regularly rounded and slightly wrinkled: spire convex; suture rather deeply impressed. Aperture dilate, lunate. Lip not reflected, a little thicker within. Umbilicus open, small. *Color*, pale reddish brown. Diameter, 0·3. *Southern States.*

H. oregonensis. (Lea, Tr. Am. Phil. Vol. 6, p. 100, pl. 23, fig. 85.) Shell moderately small, subcarinate, thin, smooth; above, slightly convex; below, somewhat inflated. *Color*, reddish brown a dark brown and white band on the carina. Diameter, 0·6. *Oregon.*

H. dealbata. (Say, Jour. Acad. Nat. Sc. Vol. 2, p. 159.) Shell moderately small, conical, oblong, thin, fragile, and somewhat ventricose. Whorls six or seven, wrinkled across, more deeply so on the spire. Spire elongated, subacute, longer than the aperture, which is longer than wide. Lip not reflected. Umbilicus small and deep. Diameter, 0·5. *Alabama, Missouri.* Resembles a *Bulimus.*

H. wardiana. (Lea, Tr. Am. Phil. Soc. Vol. 6, pl. 23, p. 67, fig. 82.) Shell convex, rounded, umbilicate, flattened below, translucent. Whorls six, longitudinally striate: spire obtuse: lip acute, thickened within. *Color*, polished corneous; animal with black stripes along the side. Diameter, 0·4. *Ohio.* Resembles *ligera.*

H. auriculata. POLYGYRA *id.* (SAY, Ac. Sc. Vol. 1, p. 277. PL. 3, fig. 28 in this volume.) Shell small, flattened above. Spire little elevated, often eroded. Whorls 5, rounded beneath, obtusely carinate above, regularly wrinkled across. Umbilicus small within, dilated without. Lip and pillar-lip irregularly dilated, and nearly closing the aperture, with a faint resemblance to an ear. *Color*, bluish white to reddish brown. Diameter, 0·4; height, 0·2. *Florida.*

This forms the type of a new genus proposed by Say, under the name of *Polygyra*, but which has not been adopted by subsequent naturalists. I have deemed it important to give a figure, as there is none extant to which the American naturalist has convenient access.

H. sayi. (WOOD, Index Suppl. pl. 7, 34 N.) Shell small. Lip reflected, forming a narrow sulcus towards the open umbilicus. *Color*, brownish.

Closely allied to, if not identical with the preceding.

H. septemvolva. POLYGYRA *id.* (SAY, Ac. Sc. Vol. 1, p. 278. FERUSSAC, pl. 51, fig. 6.) Shell much depressed, discoidal. Spire not prominent. Whorls 7, perfectly lateral, compressed and depressed, with lines and grooves above; a projecting keel on the upper edge of the body-whorl. Aperture subreniform, not contracted. Outer lip reflected; pillar-lip projecting inward into an angle or tooth. Umbilicus moderate, attenuated to the apex, so as to show the volutions. Diameter, 0·3 – 0·4. *Georgia, Florida.*

H. avara. (SAY, Ib. Vol. 1, p. 277.) Spire convex. Whorls four, rounded, wrinkled, and furnished with many short robust hairs. Aperture with two projecting obtuse teeth on the outer lip, separated by a deep sinus; pillar-lip connected to an elongate lamelliform oblique tooth on the penultimate whorl. Umbilicus moderate, not showing the volutions. Diameter, 0·25. *Florida, Carolina.*

H. aspersa. (FERUSSAC, Moll. pl. 18.)

* * WHORLS ANGULAR.

H. spinosa. CAROCOLLA *id.* (LEA, l. c. Vol. 4, p. 104, pl. 15, fig. 35. BINNEY, Bost. Jour. Vol. 3, pl. 11; and PL. 6, fig. 114 A. B. of this book.) Shell lenticular, thin, diaphanous, imperforate. Carina acute, with minute spines. Whorls 6. Spire nearly planular, being guarded by a long tooth on the columella. Outer lip irregularly thick, angulated near the upper termination. Diameter, 0·6. *Alabama.*

This belongs to the genus *Carocolla* of Lamarck, and *Helicigona* of Ferussac, but is considered by later writers as a merely artificial section.

H. cumberlandiana. CAROCOLLA *id.* (LEA, Am. Tr. Vol. 8, p. 229, pl. 6, fig. 61.) Shell lenticular, carinate, striate, widely umbilicate, impressed above and below the carina. Whorls 5. Aperture angular, within furrowed. Lip acute. *Color*, whitish brown, spotted. Length, 0·14; diameter, 0·54. *Tennessee.*

H. lasmadon. (PHILIPS, Ac. Sc. Vol. 8, p. 182.) Shell minute, moderately elevated, lenticular, rather thick, umbilicate, faintly striate. Aperture compressed, with one or two lamellar teeth. *Color*, light horn. *Alabama.*

GENUS PUPA. *Lamarck.*

Shell small, obtuse at the tip; the last whorl in the adult narrower or not larger than the others, giving it a cylindrical shape. Aperture semioval or irregular, and modified by teeth. Animal with four tentacles as in the preceding; but in the smaller species, the anterior pair scarcely apparent.

Obs. The animals composing this group are generally terrestrial, and usually small; inhabit moist places among mosses, and under the bark of rotten trees. They may be found abundantly in old deserted tanyards, feeding on woody fibres. We are indebted to Messrs. Say and Gould for the best illustration of the American species of this genus.

Pupa milium.

PLATE IV. FIG. 44.

Pupa milium. Gould, Bost. Journ. Nat. Hist. Vol 3, p. 402, pl. 3, fig. 23.
P. id. Adams, American Journal of Science, Vol. 40, p. 271.
P. id. Gould, Invertebrata of Mass. p. 187, fig. 118.

Description. Shell exceedingly minute, suboval. Whorls four, rather convex, obviously wrinkled; apex bluntly rounded: suture deep. Aperture half the width of the last whorl, heart-shaped, the apex being its right upper angle: transverse margin nearly direct; the outer margin scolloped by an indentation of the lip; remainder of the margin regularly rounded. Lip white, slightly everted. Throat with six teeth, two of which, on the transverse lip, equidistant; one with a tubercle at its base, on the middle of the left lip, and nearly at right angles with the former, is the largest; a fourth is on the indenture of the outer lip, directed between the two on the transverse lip and two smaller ones more within the shell. Umbilicus large and deep.

Color. Light chesnut.

Diameter 0·03. Height, 0·06.

Found by Dr. Gould (whose description I have adopted) in Massachusetts, and subsequently in Vermont. It will doubtless be detected in this State. Allied to *P. ovata* of Say; but that shell is larger, and the semioval aperture with seven teeth.

Pupa badia.

PLATE IV. FIG. 45.

Pupa badia. Adams, Amer. Journ. Science, Vol. 40, p. 271.
P. id. Id. Bost. Jour. Nat. Hist. Vol. 3, p. 331, pl. 3, fig. 18.
Pupilla id. Gould, Bost. Journ. Nat. Hist. Vol. 3, p. 404.

Description. Shell very obtusely tapering in the two upper whorls. Whorls seven, convex. Aperture orbicular, with a slightly reflected margin, and a single tooth on the penultimate whorl. Umbilicus moderate.

Color. Reddish brown. Diameter, 0·07. Height, 0·14.

This species has been observed at Crownpoint in this State.

Pupa exigua.

PLATE IV. FIG. 46 — (STATE COLLECTION.)

Pupa exigua. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 375.
P. id. Gould, Jour. Nat. History. Vol. 3, p. 398, pl. 3, fig. 20.
P. id. Adams, American Journal of Science, Vol. 40, p. 271.
P. id. Gould, Invertebrata of Massachusetts, p. 191, fig. 122.

Description. Shell exceedingly minute, elongate, subcylindrical. Apex somewhat obtuse. Whorls five, with minute grooved lines. Suture distinctly impressed. Aperture large and oblique, with the lip smooth and widely reflected, but not flattened. Pillar-lip bidentate; one near the middle, and the other smaller, near its inner termination. Umbilicus distinct.

Color. Pellucid watery white. Diameter, 0·04; height, 0·15.

This very minute species has been noticed in Vermont, Massachusetts and Ohio. In this State, it has been detected by Dr. Newcomb near Troy.

Pupa contracta.

PLATE IV. FIG. 47.

Pupa contracta. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 374.
P. id. Gould, Jour. Nat. Hist. Vol. 3, p. 399, pl. 3, fig 22.
P. id. Adams, American Journal of Science, Vol. 40, p. 271.

Description. Shell very small, subcylindrical. Apex obtuse. Whorls five, convex, with faint transverse lines: suture distinct. Aperture irregularly triangular. Lip widely reflected, not flattened; pillar-lip with a large elongated spoon-shaped lip, and contracting the throat into the form of a horse-shoe. An oblong thin tooth or fold far within the shell. Umbilicus large and distinct. *Color*, waxen white or dead white. Diameter, 0·05; height, 0·1.

Found among decaying logs and old stumps, from Vermont to Virginia. In this State, it has been noticed near Troy, and throughout the western district. It appears to be a common species.

Pupa ovata.

PLATE IV. FIG. 50.—(STATE COLLECTION.)

Pupa ovata. Vertigo *id.* Say, Journ. Acad. Nat. Sc. Vol. 2, p, 375.
P. modesta. Id. Long's Exped. St. Peter's, Vol. 2, p. 259, pl. 15, fig. 5. (Immature.)
P. modesta ? Gould, Invertebrata of Mass. p. 188, fig. 119.
P. ovata. Adams, Am. Journal of Science, Vol. 40, p. 271.

Description. Shell minute, subovate, thin. Apex obtuse. Whorls five to six, rounded, apparently smooth, but with minute transverse wrinkles. Aperture semioval, oblique. Lip reflected, but not flattened. Teeth five, slender and sharp: three on the pillar-lip, parallel to each other, the upper and lower small, the latter sometimes obsolete; the two other approximate, extending at right angles to the three preceding ones. Umbilicus small, but distinct.

Color. Amber or dusky brown.

Diameter, 0·02; height, 0·05 – 0·1.

Occurs in moist places under pieces of wood, from Vermont to Pennsylvania.

Pupa corticaria.

PLATE IV. FIG. 49. — (STATE COLLECTION.)

Pupa corticaria. Say, Nich. Encycl. Am. ed. No. 1, pl. 4, fig. 5.
P. id. Gould, Bost. Jour. Nat. Hist. Vol. 3, p. 397.

Description. Shell nearly cylindrical. Apex rounded. Whorls four to five, not perceptibly wrinkled or striate. Aperture suborbicular, often irregular: lip reflected. A tooth on the pillar-lip, which is near the outer angle. Inner angle with an angular projection resembling a second tooth, sometimes obsolete.

Height, 0·1.

Common under the bark of trees.

Pupa pentodon.

PLATE IV. FIG. 48; AND PLATE XXXV. FIG. 337.

Pupa pentodon. Vertigo *id.* Say, Jour. Acad. Nat. Sc. Vol. 2, p. 376.
P. curvidens. Gould, Invertebrata of Mass. p. 189, fig. 120.
P. tappaniana. Adams.

Description. Shell minute, subovate, approaching cylindrical; apex obtuse, rounded. Suture distinct, but not deeply impressed. Whorls five, convex, glabrous. Aperture semioval. Pillar-lip bidentate, of which a single prominent one is medial; the other much smaller, remote, and placed in the basal angle of the columella. Lip regularly arcuated, tridentate; the tooth

nearest the base very small, and placed near the smaller tooth of the columella; the two others larger, subequal. Umbilicus distinct.

Color. Whitish horn. Animal with two truncated tubercles, representing the anterior tentacles: foot white; and head and neck, as far as the mantle, black.

Height, 0·09.

This, according to Dr. Eights, is common about Albany and Troy. Pl. 35, fig. 337, is copied from Gould, to illustrate his *curvidens*, which is now considered as identical with this species.

Pupa fallax.

PLATE XXXV. FIG. 331.

Cyclostoma marginata:	Say, Jour. Acad. Nat. Sc. Vol. 2, p. 172.
Pupa fallax:	Id. Jour. Ac. Nat. Sciences, Vol. 5, p. 121.
P. placida:	Id. Descr. terr. and fluv. shells, p. 24.
P. fallax.	Gould, Invertebrata of Mass. p: 192, fig. 123.
P. albolabris.	Adams, American Jour. Science, Vol. 40, p: 271.

Description. Shell very small, turreted, regularly tapering to a pointed apex. Whorls six, moderately convex, polished, minutely wrinkled. Aperture unarmed, suboval, truncated above by the penultimate whorl, less than one third of the whole length of the shell. Lip white, reflected and thickened. Pillar-lip nearly straight, and turns abruptly at the front so as to form nearly a right angle. Umbilicus small, but distinct. *Color*, dusky or pale horn.

Height, 0·2 – 0·3.

This animal was first described by Say as a *Cyclostoma*, under the name of *C. marginata.* In describing *P. fallax*, he undoubtedly alludes to this as *Pupa marginata*, but thinks it differs by its larger size, and its lip not being so widely reflected. Recent American conchologists have, however, united not only these species together, but have added to them the *P. placida* of the same author,* as published in a scarce tract now out of print.

I have not been so fortunate as to detect this species in this State, but I am informed that it has been found here by Mr. Binney. Its present range is from Massachusetts to Ohio.

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* *P. placida.* (Des. terr. and fluv. shells, p. 24.) Shell pale yellowish horn; apex whitish obtuse. Whorls six and a half, somewhat wrinkled: suture moderately impressed: aperture unarmed, longitudinally oval, truncate a little obliquely above by the penultimate volution. Columella so recurved as almost to conceal the umbilicus: labrum, with the exception of the superior portion, appearing a little recurved when viewed in front, but in profile this is hardly perceptible. Umbilicus very narrow. Height, 0·3.

Since writing the above, I learn that the original specimen of the *P. placida* of Say is the *Bulimus hordeaceus* of Europe.

Pupa armifera.

Pupa armifera. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 162.
P. id. Gould, Bost. Jour. Nat. History, Vol. 3, p. 401.
P. id. Adams, American Journal of Science, Vol. 40, p. 271.

Description. Shell oblong-oval, or somewhat obtusely fusiform. Suture distinct. Whorls six, obsoletely wrinkled. Aperture longitudinally subovate. Lip reflected but not flattened, interrupted above by the penultimate whorl, and with five teeth, of which the superior, and that which precedes the basal one, are smallest. Pillar-lip with an undulated lamelliform tooth; its anterior extremity little elevated, but elongated so as almost to join the superior extremity of the exterior lip.

Height, 0·2 nearly.

Var. a. The two smaller teeth obsolete.

Var. b. The basal tooth obsolete.

This species has been found at Crownpoint in this State, and ranges westwardly to Missouri.

Pupa simplex.

PLATE XXXVI. FIG. 347.

Pupa simplex. Gould, Bost. Jour. Nat. Hist. Vol. 3, p. 403, pl. 3, fig. 21. Id. Invertebrata of Massachusetts, p. 190, fig. 121.

Description. Shell minute; two-thirds of the shell cylindrical, surmounted by a rapidly formed blunt apex, smooth. Whorls five, moderately convex, quite smooth, separated by a distinct suture. Aperture circular, except for a small section from the posterior portion, which is cut off by the encroachment of the preceding whorl. Lip simple and sharp, slightly everted on the left side, and partially hiding a small umbilicus. No trace of a tooth.

Color. Light chesnut.

Diameter, 0·02. Height, 0·05.

This appears to be a rare species, observed in Massachusetts, and first described by Dr. Gould.

(*EXTRA-LIMITAL.*)

P. rupicola. (Say, Jour. Ac. Vol. 2, p. 163. *P. procera*, Gould, Jour. Bost. Soc. p. 481.) Shell minute, attenuated to an obtuse apex. Whorls six, glabrous; suture deeply impressed; pillar-lip bidentate; upper tooth lamelliform, emarginate in the middle; lower tooth placed on the columella, and nearly at right angles with the preceding; lip tridentate; teeth placed somewhat alternately with those of the pillar-lip. *Color*, white. Height, 0·1. *Florida.*

GENUS SUCCINEA. *Draparnaud.*

Animal elongated, spiral, larger than the shell: tentacles four. Amphibious. Shell ovate, subelongate, pellucid straw-colored, very thin: aperture very large, oval, entire, rounded before, angular behind: lip simple. Whorls three.

Succinea ovalis.

PLATE IV. FIG. 51, VAR., and 52. — (STATE COLLECTION.)

Succinea ovalis. SAY, Nich. Encycl. No. 2, Jour. Ac. Nat. Sc. Vol. 1, p. 15, and Vol. 2, p. 163.
S. id. ADAMS, American Jour. Science, Vol. 40, p. 270.
S. id. GOULD, Invertebrata of Mass. p. 194, fig. 125.

Description. Shell suboval, diaphanous. Whorls nearly three, oblique. Body very large. Spire small, but little prominent, somewhat obtuse. Columella much narrowed, so as almost to permit a view of the interior apex from the base of the shell. Scarcely any calcareous deposit on the pillar-lip.

Color. Pale yellowish. Animal pale, with black stripes on its neck, and squares or bands on its sides.

Length, 0·3 – 0·5.

Var. A. Minutely striated and distinctly impressed with a medial revolving line, large.

This is a common species about the margins of ponds, and in damp places. The shell is so vitreous, according to Dr. Gould, as to permit the viscera and circulatory apparatus to be seen through it. The distinctive characters of the species by the shell alone are so few, that when I obtained the var. A. from streams in Rockland county, I supposed that it was quite distinct enough to form a separate species under the name of *lineata*. Such a course in this genus now appears to me premature, until I succeed in obtaining the living animal. The typical form of this species (fig. 52) bears a striking resemblance to *S. putris*, var. γ. of Ferussac (*Hist. Nat. Moll.* pl. 11, A. fig. 7 – 8).

Succinea obliqua.

PLATE IV. FIG. 53. — (STATE COLLECTION.)

Succinea obliqua. SAY, Long's Exped. St. Peters, Vol. 2, p. 260, pl. 15, fig. 7.
S. id. ADAMS, Am. Journal of Science, Vol. 40, p. 270.

Description. Shell oblong-oval, nearly pellucid. Whorls three, very obliquely revolving, and distinctly wrinkled. Spire a little prominent. Aperture sub-oval, sub-oblique.

Color. Pale amber. *Animal:* tentacles margined posteriorly, and tipped with black.

Length, 0·5 – 0·9.

This species is closely allied to Say's *S. campestris*, and he thinks it may possibly be allied to *Helix putris* of Linneus. The whorls of this species, as far as I have seen them, are not as convex as in the following species; but it must be confessed that these are scarcely appreciable differences. I have obtained it in the neighborhood of New-York, and from Littlefalls in Herkimer county, and the vicinity of Lake Champlain. It is found adhering to weeds, and, when alive, is finely variegated with light horn-color and olive-brown: the shell is also very flexible.

Succinea campestris.

PLATE IV. FIG. 54. A. B. — (STATE COLLECTION.)

Succinea campestris. Say, Nich. Ency. No. 1. Journ. Acad. Nat. Sc. Vol 1, p. 281.
S. id. Gould, Invertebrata of Mass. p. 195, fig. 126.

Description. Shell oval, thin, very fragile, transparent. Whorls three, not very oblique, very convex; the last very turgid. Suture deep. Aperture suboval, almost as broadly rounded above as below.

Color. Olive yellow to pale yellow. Animal whitish, with a black line passing under the eyes.

Length, 0·3 – 0·6.

This species is found more remote from water than any of the preceding. The markings of the animal may be as distinctly seen through the shell as in *S. obliqua.*

Succinea avara.

PLATE IV. FIG. 55. — (STATE COLLECTION.)

S. avara. Say, Long's Exped. St. Peters, Vol. 2, p. 260, pl. 15, fig. 6.
S. vermeta? Say, Desc. terr. and fluviatile shells, p. 23. (Adult.)
S. id. Adams, Amer. Journ. Science, Vol. 40, p. 270.
S. avara. Gould, Invertebrata of Mass. p. 196, fig. 127.

Description. Shell quite small, very thin and fragile, and usually covered with an earthy crust. Whorls three, rounded, minutely wrinkled: suture deep. Body-whorl very large. Aperture in the adult half as long, and in the young two-thirds of the whole length of the shell. Spire elongated, small and acute.

Color. Pale reddish yellow or straw-color, often covered with a blackish earthy crust and agglutinated minute pebbles.

Length, 0·2; of aperture, 0·15.

This species was first detected by Say in the Northwest territory. It has since been observed in the Northern and Middle States. My specimens were obtained from an island in Lake Champlain.

(*EXTRA-LIMITAL.*)

S. retusa. (Lea, Am. Phil. Trans. Vol. 5, p. 117, pl. 19, fig. 86.) Shell ovate-oblong, very thin, pellucid; spire short; whorls three; aperture dilated below, and drawn back. *Color*, yellowish. Length, 0·7; diameter, 0·3. *Cincinnati.*

GENUS BULIMUS. *Bruguières. Lamarck.*

Shell oblong, oval-oblong or turreted. Aperture simple or entire, rounded anteriorly. Columella straight, smooth.

Obs. This genus comprises species which were found distributed by Linneus under the genera *Helix* and *Bulla.* It forms the subgenus *Cochlicopa* of Ferussac, but the best conchological writers prefer arranging it as a separate genus in the vicinity of *Helix.* The animals are terrestrial, and some of them are remarkable for the size and stony hardness of their eggs. Few species have been detected in this country.

Bulimus lubricus.

PLATE III. FIG. 43.—(STATE COLLECTION.)

Bulimus lubricus. Bruguieres, Dict. No. 23.
B. *id.* Say, Long's Expedition St. Peters, Vol. 2, p. 259. Adams, Am. Jour. of Sci. Vol. 40, p. 270.
B. *id.* Gould, Invertebrata of Massachusetts, p. 193, fig. 124.

Description. Shell very small, thin, polished and transparent, elongate-oval. Whorls five or six, rounded, lessening to the obtuse apex, with a distinct suture. Aperture small, oval, not broadly rounded at the base. Pillar-lip slightly thickened, so as to present the appearance of a slight notch at the base. Lip simple, thickened within.

Color. Yellowish olive; the inner margin of the lip light reddish: often smoky horn-colored throughout.

Diameter, 0·1. Height, 0·3.

This species, which was first detected by Mr. Say in the Northwest territory, has since been ascertained to have a wide geographical range. It occurs under rotten wood and leaves. The specimen which furnished the above description was obtained from Oriskany, Oneida county, but it doubtless occurs throughout every part of the State. I have never had an opportunity of examining European specimens of this species.

(*EXTRA-LIMITAL.*)

B. mutilatus. (Say, Jour. Acad. Vol. 2, p. 373.) Shell large, turreted. Whorls 4, longitudinally striate with elevated lines: suture moderate. Apex widely truncate. Lip whitish, with no calcareous deposit. Body-whorl more than double the width of the truncated apex. Spire $1\frac{1}{2}$ times longer than the aperture. *Color*, pale reddish brown. Length, 0·9. *Charleston.*

B. multilineatus. (Say, l. c. 5. 120.) Shell small, conic, not very obviously wrinkled. Whorls not very convex: suture lineolar, not deeply indented: umbilicus small: lip simple, blackish. *Color:* whorls yellowish white, with transverse entire reddish brown lines; a blackish subsutural revolving line: apex blackish: umbilicus surrounded by a broad blackish line: columella whitish. Diameter, 0·3. *Florida.*

Genus Achatina, *Lam.* Shell ovate or oblong; aperture entire, longer than broad; lip sharp, never reflected. Columella smooth, truncated at the base.

A. solida. (Say, Ac. Sc. Vol. 5, p. 122.) Shell rather ponderous, conic, elongated, nearly smooth or with distant wrinkles; whorls about 7; spire prominent; mouth rather small; labrum thickened on its inner submargin; columella hardly truncated, with a somewhat prominent ridge on the inner side near the base. *Color*, yellowish. Length, 2·5. *Florida.*

A. vexillum, Humph. (Plate 4, fig. 56 of this work.) Shell ovate-conic, smooth, with eight convex whorls, minutely striated. *Color*, bluish, varied with yellow and reddish revolving bands. Length, 1·0 – 1·5. *Florida.*

A. virginea, Lin. (Ferussac, Moll. pl. 120.) Shell ovate-conic, smooth, with convex whorls; lip with one plait. *Color*, white, with red and black revolving bands. Length, 1·0 – 2·0. *Florida.*

A. striata. (Fer. Moll. pl. 136, fig. 6 – 10.) *Florida.*

A. flammigera. (Id. Moll. pl. 118, fig. 5 – 7.) *Florida.*

Genus Glandina. Shell subturreted, oblong, suboval, somewhat fragile; front of the shell gradually attenuated to the base of the columella; aperture unarmed, rather narrow, nearly longitudinal; lip simple, a little undulated; columella incurved, a little truncated at the base.

G. truncata. (Planorbis *glans*, Say, Ac. Sc. Vol. 1, p. 282.) Spire rather truncated, somewhat mammillary at the tip; whorls 5 – 6, wrinkled; suture irregularly crenated. *Color*, pale reddish brown. Length, 1·5. *South-Carolina* and *Florida.*

FAMILY AURICULIADÆ.

Shell always spiral and variable. Aperture dentate, and always lateral in relation to the axis. Animal elongated, with the body distinct from the foot: no mantle: a collar. Tentacles two, with the eyes at or near their base. Mouth usually armed with an upper tooth opposed to the tongue. Pulmonary cavity and its orifice placed forward. Generative organs united or distant. Terrestrial or marine: freshwater?

Obs. This small family corresponds with the *Auriculacés* of Blainville, and the *Limnocochlides* of Ferussac.

GENUS AURICULA. *Lamarck.*

Shell oval, more or less pointed and elongated, rarely cylindrical. Spire with five or six whorls; the last enveloping the others. Aperture long and narrow, ear-shaped, with two or more folds on the pillar. Animal elongated, enlarged in front into a rostrum or snout. Tentacles short, cylindrical, gland-shaped above. Eyes placed at the internal base of the tentacles, slightly behind. Foot not divided.

Auricula bidentata.

PLATE V. FIGS. 92, 1, 2, 3.

(STATE COLLECTION.)

Melampus bidentatus. Say, Jour. Acad. Nat. Sc. Vol. 2, p. 245.
Auricula cornea. Lamarck, An. sans vert. Ed. alt. Vol. 8, p. 339.
A. bidentata. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 67.
A. id. Gould, Invertebrata of Massachusetts, p. 197, fig. 130.

Description. Shell thin, translucent, smooth, broadest about the upper third. Whorls five or six, somewhat rounded; the last forming the largest part of the shell, with minute wrinkles and revolving striæ. Pillar-lip bidentate: the upper one, which may be considered as a fold, is prominent, transverse, and placed below the middle; the other oblique, not so large, formed by the outer lip as it turns within the shell. Outer lip with four or five parallel revolving ridges, not attaining the edge of the lip. Spire short and blunt. Aperture long and narrow, widest below.

Color. Dark reddish brown. Animal reddish brown above, beneath paler. Rostrum nearly as long as the tentacles, bilobed. Foot transversely bifid.

Diameter, 0·3. Height, 0·5.

Var. a. Aperture narrowed beneath, and with 3 4 revolving dark lines.

This is a common species in the salt marshes about New-York; often observed near the salt water, and said to have been found in the interior. They are occasionally submerged, but do not appear to live in the water. Found from Vermont to Florida.

Auricula denticulata.

PLATE V. FIGS. 93 & 91. Variety.

(STATE COLLECTION.)

Voluta denticulata. Montagu, Test. Britt. p. 234, pl. 40, fig. 5.
Auricula personata. Lamarck, An. sans vert. Ed. alt. Vol. 8, p. 334.
A. denticulata. Gould, Invertebrata of Mass. p. 199, fig. 129.
A. borealis? Conrad, Jay's Catalogue of Shells, No. 1991-2.

Description. Shell thin, elongated: apex acute: spire elevated. Whorls eight, more or less convex; the suture towards the apex being frequently deeper than elsewhere, and rendering these whorls more convex: often with a marginal line near the lower sutures. Surface polished, with faint incremental lines. Inner lip in the adult with three white folds or teeth; the lowest formed by the fold of the base of the outer lip; the middle one largest, and the upper scarcely conspicuous. Umbilicus small, concealed by a fold.

Color. Epidermis very thin, and of shining horn or greyish, often amber-colored. Animal yellowish. Foot bilobed in front, and divided across towards the front.

Diameter, 0·12. Height, 0·3.

This species appears to live exclusively in and near salt water. I have obtained specimens from the wharves, and others have been sent to me, dredged from the harbor of New-York. The *borealis* of Jay's Catalogue, of an olive-green color, an elevated apex, and with slightly impressed sutures (fig. 91), with a thin transverse tooth above and a small sinuous tooth beneath, I suppose to be a young variety of the above described species.

(*EXTRA-LIMITAL.*)

A. obliqua. (Say, Jour. Acad. Nat. Sc. Vol. 2, p. 377.) Shell obconic, rather thick; spire little elevated; whorls 8–9, wrinkled across: pillar-lip with two very distinct teeth, and slighter prominences between them; lower tooth very oblique, terminating at the base; lip with 8 teeth or striæ, terminating on the margin; base of the aperture contracted by the basal tooth. *Color*, reddish brown. Height, 0·4. *Charleston.*

FAMILY LIMNIADÆ.

Shell always complete, thin, smooth, much convoluted: outer lip trenchant, not reflexed. Animal with its body elongated, distinct from the foot: no cuirass, but a collar formed around the neck by the margin of the mouth. Head furnished with a wide sort of veil. Tentacles two, with the eyes at their base. Pulmonary orifice on the collar. Organs of generation separated. Vent near the pulmonary orifice. All fluviatile.

GENUS PLANORBIS. *Lamarck.*

Shell discoidal, sinistral. Spire depressed or concave, exhibiting the whorls above and below. Aperture broader than long; the margin sharp, and not reflexed. Animal elongated, compressed, with two very long filiform tentacles. Mouth with a crescent-shaped tooth above, and the tongue armed with small hooks, surmounted by a sort of short emarginated veil. Breathing-hole dextral, on the collar, and the vent near it. Organs of generation on the same side, separate; the male near the tentacle, and the other at the base of the collar. All living in fresh water.

PLANORBIS TRIVOLVIS.

PLATE IV. FIG. 59. A. B.

(STATE COLLECTION.)

Planorbis trivolvis. SAY, Encyclop. Nich. Am. ed. Vol. 4, pl. 2, fig. 2.
P. *id.* SAY, American Conchology, pl. 54, fig. 2.
P. *id.* GOULD, Invertebrata of Mass. p. 201, fig. 131.

Description. Shell discoidal. Whorls three or four, marked with regular transverse lines, rather acutely carinated above and beneath, more obtusely so on the circumference: these carinæ most obvious on the young shell. Suture most apparent on the upper or right side, which has a depressed spire; beneath cup-shaped. Aperture large, higher than wide, embracing a considerable portion of the body-whorl, inclining to the left. Lip abruptly angulated at the termination of the carina, thickened within.

Color. Pale yellow or olive. Animal dusky, with pale yellowish confluent spots.

Diameter of the shell, 0·5 – 0·7; height, 0·2 – 0·3.

This species, which ranges through the Northern and Western States, is abundant in many of the streams and ponds of New-York.

Planorbis bicarinatus.

PLATE IV. FIG. 63. A. B.

(STATE COLLECTION.)

Planorbis	*bicarinatus.*	Say, Nich. Encyclop. Vol. 4, No. 2, pl. 1, fig. 4.
P.	*id.*	Id. American Conchology, pl. 54, fig. 3.
P.	*id.*	Haldeman, Limniadæ, p. 3, pl. 1, fig. 1.
P.	*id.*	Gould, Invertebrata of Mass. p. 203, fig. 134.

Description. Shell orbicular, deeply indented above and beneath. Whorls three, wrinkled with minute revolving lines, and strongly carinate on both its sides. Aperture large, abruptly vaulted at the carina of the right or upper side. Lip slightly expanded.

Color. Pale yellow or brownish; reddish brown within, lighter colored on the carina. Animal brownish, dotted with light reddish yellow. Foot tongue-shaped.

Diameter of the shell, 0·5. Height 0·3.

Not as numerous as the preceding, but found in sluggish streams and ponds in the State. The figure is not at all characteristic of the species.

Planorbis lentus.

PLATE V. FIG. 80.* A. B.

(STATE COLLECTION.)

Planorbis	*lentus:*	Say, Am. Conchology, pl. 54, fig. 1.
P.	*id*	Gould, Invertebrata of Mass. p. 202, fig. 132

Description. Whorls three above and four beneath, marked by raised incremental lines above, or on the right side, concave, with a distinct suture; beneath, not so deep: the whorls slightly carinate. Aperture large, oval; its lower margin lying in the plane of the transverse diameter of the shell.

Color. Dark greenish; lip within dark reddish brown. *Animal*, dark olivaceous above and below: foot oval, minutely dotted with yellowish.

Size of the preceding.

This is nearly as common as the preceding, with which it has usually been confounded. It is chiefly distinguished from it by the left margin of the lip being in the plane of the transverse diameter, whilst in *trivolvis* it is below it.

Planorbis megastoma.

PLATE IV. FIGS. 60 & 61.

(STATE COLLECTION.)

Description. Shell large, coarse and solid. Whorls nearly five, rounded, with coarse transverse waving wrinkles, becoming larger towards the mouth. A large prominence on the body-whorl nearly opposite to the aperture, producing an obtuse angle. Spire depressed, with the suture distinct; beneath, the volutions are exhibited nearly to the apex. Mouth dilated, but somewhat contracted at the margin, 0·3 wide and 0·4 high; its lower portion rounded, arising from the lower part of the penultimate whorl; line of the upper margin more nearly straight. In the young (fig. 60), the aperture is not so much dilated, and is obscurely trigonal, with the lower margin beneath the plane of the transverse diameter of the shell.

Color. Olivaceous, tinged with yellowish within the aperture. In the young, black, with the interior of the aperture dull reddish.

Diameter, 0·8. Height, 0·3.

This *planorbis* was found near Lake Ontario, and appears to be different from any species yet described. In its aperture it resembles the small *P. dilatatus* of Gould, but is otherwise very distinct.

Planorbis campanulatus.

PLATE V. FIG. 99.* A. B.

(STATE COLLECTION.)

Planorbis	*campanulata.*	Say, Jour. Acad. Nat. Sc. Vol. 2, p. 266.
P.	*id.*	Adams, American Journal of Science, Vol. 40, p. 269.
P.	*id.*	Gould, Invertebrata of Massachusetts, p. 204, fig. 133.

Description. Shell regular, small, transverse lines and grooves; with four whorls above, which are carinated, and form a conspicuous cavity; beneath much deeper, and nearly perforating the shell to the apex. Aperture suddenly dilated, and subtrigonal or bell-shaped; its upper margin being elevated above the plane of the shell.

Color. Light olive-green; aperture brownish, polished.

Greatest diameter, 0·5. Height, 0·2.

This species occurs in most of the lakes in the western district of the State.

Planorbis obliquus.

PLATE IV. FIG. 57. A. B.

(STATE COLLECTION.)

Description. Shell depressed, discoidal. Volutions four; the surface shining, with regular minute incremental lines; the body-whorl obsoletely subangular below. Spire nearly as much depressed as the umbilicus, which latter is large, and exhibits all the volutions to the apex: suture distinct; body-whorl not distinctly deflected from the plane of the other volutions. Mouth unarmed, very oblique.

Color, dull olive.

Diameter, 0·3. Height, 0·1.

The specimens of this species were obtained from the Mohawk, and from Newcomb's pond in Pittstown, and presented by Dr. B. W. Budd of this city. Some eminent conchologists suppose it to be a variety of the *deflectus* of Say; but from this it differs by the obliquity of the mouth when turned downwards, and has no acute lateral edge as in that species. The *concavus* of Anthony, of which I have seen specimens but no description, may possibly be the young of this, but at all events is a closely allied species.

Planorbis armigerus.

PLATE IV. FIG. 64. A. B. C.

(STATE COLLECTION.)

Planorbis armigerus.	Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 164.
P. *id.*	Adams, American Journal of Science, Vol. 40, p. 269.
Discus *id.*	Haldeman, Monograph of the Limniades, No. 1.
Planorbis d.	Gould, Invertebrata of Massachusetts, p. 205, fig. 138.

Description. Shell small, obsoletely wrinkled. Upper surface slightly concave; the suture distinct. Whorls four, with minute revolving lines on the under side. Umbilicus deep, exhibiting all the volutions. Aperture very oblique, with the carina continued to its edge. Throat armed with five teeth, which are large, white, and nearly fill the aperture; two on the pillar-lip, one of which is large and oblique, with a smaller one near it; on the lip a prominent lamelliform tooth near the base, with two small oblique ones above.

Color. Light olive brown. Animal dusky bluish.

Diameter of the shell, 0·3. Height, 0·1.

Common in swamps and ponds in all parts of the State. The teeth, which form so remarkable a character in this species, are so far within the aperture as not to be obvious at first sight; they are exceedingly irregular, not only in their shape, but distribution; their general form and arrangement, however, corresponds very well with the description given by Mr. Say. This and *corpulentus* are described as dextral shells.

Planorbis exacutus.

PLATE IV. FIG. 62. a. b.

(STATE COLLECTION.)

Planorbis exacutus. Say, Jour. Acad. Nat. Sci. Vol. 2, p. 164.
P. *id.* Adams, Am. Jour. of Sci. Vol. 40, p. 269.
P. *id.* Gould, Invertebrata of Mass. p. 208, fig. 137.

Description. Shell thin and fragile, much depressed, lenticular. Whorls four; upper and under sides slightly convex, flattened to the periphery, and forming an acute edge which is continued on the middle of the aperture, which is below the plane of the transverse diameter: surfaces of the whorls transversely striated. Umbilicus regular, showing all the volutions to the apex. Suture moderately impressed. Whorls wider than high. Aperture subtriangular, oblique. Lip angulated in the middle, arched near its lower tip; the upper termination just including the acute edge of the penultimate whorl.

Color, light corneous.

Diameter, 0·2 – 0·3. Height, 0·07 – 0·1.

Common in ponds and ditches. I have obtained it from the northern and western districts. It is one of the most fragile and most depressed of all the species.

Planorbis parvus.

PLATE IV. FIG. 58.

(STATE COLLECTION.)

Planorbis parvus. Say, Nich. Ency. Ed. Am. Vol. 4, pl. 1, fig. 5.
P. *id.* Gould, Invertebrata of Mass. p. 209, fig. 139.

Description. Shell small, thin, depressed, discoidal; upper side nearly plane, but concave in the centre. Umbilicus broadly concave, and both sides exhibiting all the volutions. Whorls four; the body-whorl obtusely carinated on its circumference, and with impressed incremental lines. Aperture rounded, oblique; its upper and lower margins in the plane of the transverse diameter of the shell. Lip sharp, not thickened.

Color. Varying from reddish brown to yellowish or olivaceous. Animal whitish, darker above.

Diameter, 0·08 – 0·1. Height, 0·02 – 0·04.

Common. I have received specimens from the Mohawk and Connecticut rivers, which only differ from the above in having the upper edge of the mouth nearly in the centre of the last whorl. I refer them with doubt to the above named species. It is one of the smallest of the group.

Planorbis corpulentus.

PLATE VIII. FIG. 185.* a. b.

Planorbis corpulentus. Say, Long's Exped. St. Peters, Vol. 2, p. 262, pl. 15, fig. 9.
P. id. Adams, American Journal of Science, Vol. 40, p. 269.

Description. Shell large, dextral. Whorls three to four, rather rugged with coarse wrinkles. Upper surface much flattened, and edged by an acute line, which is distinct to the margin of the lip: sides hardly rounded, and terminated below by another carina not as sharp as the one above. Spire slightly concave. Umbilicus exhibiting all the volutions to the apex. Aperture longer than wide; the upper part extending higher than the preceding volution, and the lower part declining much lower than the lower line of the same volution.

Color, olive brown.

Diameter, 0·7. Height, 0·2.

This animal is found in Lake Champlain, and in other portions of the State. There is much diversity of opinion in relation to this species; some supposing it to be an exuberant growth of *trivolvis*, and others assert it to be a large variety of *lentus*. To me it appears to want the nearly equal concavity of both the upper and under surfaces of the *trivolvis*, and the appearance of all the volutions distinguishes it from *lentus*.

It has been observed in Lake Champlain, and has a wide geographic range. The following species, described by Dr. Gould, I have not seen myself; but as they exist in Massachusetts, they will in all probability be found in this State.

Planorbis hirsutus.

Planorbis hirsutus. Gould, American Journ. of Science, Vol. 38, p. 196.
P. id. Id. Invertebrata of Mass. p. 206, pl. 135.

Description. Shell small: both sides concave, the left rather more than the right, but the concavity is there more limited by the presence of a subangular ridge on the outer whorl. Whorls three; the outer one rapidly increasing. Surface exhibiting traces of revolving lines when denuded, but usually covered with a dark pigment or epidermis bristling with rigid hairs, which are arranged in close revolving lines: lines of growth very faint. Aperture suboval, oblique; its diameter from side to side shortest.

Color. Transparent brownish yellow. Animal slate-colored above on the head, with a darker line along the tentacles; foot chesnut.

Diameter, 0·4. Height, 0·15.

Stagnant pools. Allied to *deflectus*.

Planorbis elevatus.

Planorbis elevatus. Adams. Journ. Nat. Hist. Vol. 3, pl. 3, fig. 15.
P. *id.* Gould, Invertebrata of Mass. p. 207.

Description. Shell small, faintly marked with incremental lines. Whorls three and a half to four; the tube not rapidly enlarging, and considerably flattened. Whole shell flat or slightly elevated above, the tip depressed so as to form a small pit; below with a deep funnel-shaped cavity, the whorls appearing obscurely angulated: suture deeply impressed. Aperture slightly oblique: its upper edge on a level with the spire, or slightly declining; lower edge descending considerably beneath the level of the under surface; portion of the preceding whorl embraced by the aperture, constituting about one fifth of its circuit.

Color. Light grass-green, translucent.

Diameter, 0·25. Height, 0·1.

Allied to *parvus*, which is, however, more depressed, aperture more oblique, and the upper surface more broadly and deeply concave; to *hirsutus*, which is more elevated, and deeply concave above and below. Dr. Gould imagines that it will prove to be the immature shell of some other species.

Planorbis deflectus.

Planorbis deflectus. Say, Long's Exped. St. Peter's, Vol. 2, p. 261, pl. 15, fig. 8.
P. *id.* Gould, Invertebrata of Massachusetts, p. 207, fig. 136.

Description. Shell small, distorted, depressed, finely wrinkled: right side in general convex, but with the centre slightly indented; suture distinct; left or under side concave, forming an expanded umbilicus, exhibiting one-half of each whorl. Whorls four or five, very much depressed, descending to an acute lateral edge below the middle; the last whorl turns somewhat suddenly downwards. Aperture large, ovate. Lip commencing below the keel, and embracing but a very small part of the preceding whorl, much narrower from side to side, and its plane oblique to the axis of the shell: lip simple, very slightly everted beneath.

Color. Light greenish yellow or soiled waxen. Animal dusky above, with a dusky line to the top of the tentacles.

Diameter, 0·4. Height, 0·1.

Adhering to stones, etc. in ponds; occasionally with scattering hairs on its surface. In the very young animal, the remarkable deflection of the last whorl not conspicuous.

Planorbis dilatatus.

P. lens? Lea, Am. Phil. Soc. Vol. 6, p. 68, pl. 23, fig. 83.
P. dilatatus. Gould, Invertebrata of Mass. p. 210, fig. 140.

Description. Shell very small, minutely wrinkled. Spire flat, composed of not more than three whorls, separated by a well defined suture: outer whorl has a sharp margin on a level with the spire, diminishing near, but still modifying the aperture; below this line the whorl is very convexly rounded, so as to encircle a small deep abruptly formed umbilicus: this whorl rapidly enlarges into a very large, not very oblique aperture, with the lip expanded into a trumpet-shape. *Color*, yellowish-green.

Diameter, 0·15. Height, 0·05.

This small species ranges from Massachusetts to Maryland and Ohio, occuring in pools, mosses, etc. The previous name of Mr. Lea is preöccupied by a fossil species.

(*EXTRA-LIMITAL.*)

P. glabratus. (Say, Nich. Ency. No. 5; Jour. Ac. Vol. 1, p. 280.) Shell large; whorls five, glabrous or obsoletely rugose, polished, not carinated; spire perfectly regular, a little concave; umbilicus large, regularly and deeply concave, exhibiting all the volutions to the summit; aperture declining, remarkably oblique. Diameter, 0·9. *South-Carolina.*

P. antrorsus. (Conrad, Am. Jour. Vol. 25, p. 343.) Shell dextral, not depressed; whorls three; spire profoundly indented or concave, with the summit of the body-whorl angulated; umbilicus profound, with the margin and inner volutions angulated; body-whorl abruptly dilated near the aperture, which is longitudinally subovate. *Alabama.*

P. virens. (Adams, Bost. Jour. Vol. 3, p. 326, pl. 3, fig. 15.) Shell small; a rough epidermis, and with transverse striæ and revolving lines; spire not prominent, scarcely concave; last whorl flattened above, then abruptly curving downwards, subcarinate below; aperture nearly orbicular; umbilicus as broad as the last whorl, deep, and showing all the volutions. *Color*, greenish horn Diameter, 0·23; height, 0·09. *Vermont.*

GENUS LIMNEA. *Lamarck.*

Animal spiral, elongated or oval. Head with two flattened triangular tentacles, with the eyes at their internal base. Mouth surmounted by a free thin movable appendage. Foot oval, bilobed in front, contracted behind. Breathing orifice on the right side, narrow, oblong, and covered by a fleshy appendage which borders it beneath: vent near it. Generative organs distant: the male under the right tentacle; female near the breathing orifice. Sexes united in the same individual. *Shell* thin, dextral, oval, elongated; spire more or less acute and elongated: aperture longer than wide, oval, occasionally very large; lip thin; an oblique fold on the columella.

Obs. The animals of this genus inhabit fresh water streams, or their vicinity, feeding on aquatic animalculæ. The American species have been carefully studied and beautifully illustrated by Mr. Haldeman.

Limnea catascopium.

PLATE V. FIG. 80.

(STATE COLLECTION.)

Lymnea catascopium. Say, Nich. Ency. Vol. 4, p. 2, fig. 3; Am. Conchology, pl. 55, fig. 2.
L. pinguis? var. Id. Jour. Acad. Nat. Sciences, Vol. 2, p. 123.
L. decollata. Adams, Bost. Jour. Nat. Hist. fide Haldemani.
L. catascopium. Gould, Invertebrata of Massachusetts, p. 223.
L. id. Haldeman, Monog. of the Limniades, No. 3, p. 6, pl. 1, figs. 1–12.

Description. Shell smooth and polished, oblong-ovate. Whorls four or five, convex, with wrinkled incremental lines, and rapidly tapering to an acute apex: body-whorl large and ventricose: spire shorter than the aperture: aperture ovate. Lip simple, thick, and regularly curved: pillar-lip concave, with a distinct fold.

Color. Yellowish horn or blackish. Animal yellowish brown, minutely punctate with light yellowish: foot rounded behind.

Diameter, 0·2–0·4. Height, 0·5–0·7.

I have followed Mr. Haldeman in uniting the *pinguis* of Say with the above. Common in the western district of this State. It ranges from Massachusetts to Delaware, and westwardly through the Northwest territory.

Limnea fragilis.

PLATE IV. FIG. 68.

(STATE COLLECTION.)

Helix fragilis. Lin. *L. elodes.* Say, Journ. Acad. Vol. 2, p. 169; Am. Conchol. pl. 31, fig. 2.
L. elodes. Gould, Inverteb. Mass. p. 221, figs. 146, 147. Adams, Am. Journ. Vol. 40, p. 268.
L. fragilis. Haldeman, Monog. Limn. p. 20, pl. 6, figs. 1 – 11, p. 53; pl. 15, fig. 1.

Description. Shell oblong-conic, gradually acuminated. Whorls six, convex, with transverse lines, frequently marked with irregular elevated reticulations. Suture rather deeply impressed. Aperture generally shorter than the spire. Pillar-lip with an angular deposit of enamel.

Color. Brownish tinged with yellowish, or amber-colored; occasionally with a dusky epidermis. Animal dusky, dotted with yellow. Tongue spoon-shaped: mouth margined in front with a black horny plate.

Diameter, 0·1 – 0·3. Length 0·6 – 0·9.

One of our most common species, and referred by Mr. Haldeman, after a direct comparison, to the *L. fragilis* of Europe. Ranges from Canada to Pennsylvania, and to the Pacific westward.

Limnea umbrosa.

PLATE IV. FIG. 76.

(STATE COLLECTION.)

Limneus elongatus. Say, Journ. Acad. Vol. 2, p. 167.
L. umbrosa. Id. Am. Conchol. pl. 31, fig 1.
L. umbrosa. Adams, Am. Journ. Science. Vol. 40, p. 268.
L. idem. Haldeman, Monograph Limniades, p. 24, pl. 7, figs. 1 – 8.

Description. Shell elongated, ventricose. Whorls six, slightly convex. Surface with numerous minute spiral lines. Suture oblique, with little depth, but well marked. Spire slender: apex acute. Fold on the columella not well marked. Aperture wide, nearly straight on the inside, wide anteriorly, less than half the length of the shell. Body-whorl above longer than half the entire length, often marked with reticulated lines forming facets as in the preceding species.

Color. Corneous, tinged with red or reddish brown. Margin of the lip lighter. Occasionally the surface with light longitudinal lines.

Length, 1·3; of aperture, 0·7.

This species occurs from Canada to Illinois. The first name imposed by Say having been preöccupied, he changed it to that which it now bears.

Limnea caperata.

PLATE IV. FIGS. 66 & 69. — PLATE V. FIG. 79. Young?

Limneus caperatus. Say, Des. terr. and fluv. shells, p. 23.
L. umbilicata. Adams, Bost. Journ. Nat. Hist. Vol. 3, p. 315, pl. 3, fig. 14.
L. id. Gould, Invertebrata of Mass. p. 218, fig. 149.
L. id Haldeman, Monog. Limniades, p. 34, pl. 11, figs. 1 – 9.

Description. Shell conic. Whorls five or six, separated by a deep suture: apex pointed or entire. Lines of growth fine, but apparent. Surface closely covered with numerous and very fine spiral light-colored elevated epidermal lines: these become usually obsolete on the adult shell. Aperture ovate, semicircular or subrotund. Pillar-lip with a fold more or less distinct, and folding over the umbilicus.

Color. Yellowish or reddish brown, occasionally with whitish or reddish varicose bands. Aperture frequently stained with reddish brown. Animal almost black, minutely and sparsely dotted with whitish: tentacles long and very flat: foot rounded behind.

Length, 0·2 – 0·4.

My specimens were obtained from the Mohawk river. A variety of this species, beautifully reticulated with transverse and revolving striæ, was procured at Sandy pond near Lake Ontario, Oswego county. They were numerous on the upper surface of the leaves of the Pond-lily.

Limnea pallida.

PLATE IV. FIG. 67.

(STATE COLLECTION.)

Limnea pallida. Adams, Am. Jour. Sc. Vol. 39, p. 374; Vol. 40, p. 268. Id. Bost. Jour. Nat. Hist. Vol. 3, p. 324, pl. 3, fig. 3.
L. id. Haldeman, Monog. Limniades, p. 45, pl. 13, figs. 11–13.

Description. Shell conical, smooth, imperforate and fragile. Whorls five or six, slightly convex. Suture shallow, but well defined. Spire as long or longer than the aperture, with a subacute apex. Aperture ovate, symmetrical. Fold on the columella well marked and remarkably constant. Incremental lines very fine and undeviating, crossed by minute spiral corrugations.

Color. Varying from pale ochraceous to white. Apex often tinged with brown.

Length, 0·3 – 0·4.

I am indebted to Prof. Emmons for specimens of this shell, which he obtained from Lake Champlain.

Limnea megasoma.

PLATE IV. FIG. 70.

(STATE COLLECTION.)

L. megasomus. Say, Long's Exped. St. Peters, Vol. 2, p. 263, pl. 15, fig. 10.
L. id. Adams, American Journal of Science, Vol. 40, p. 267.
L. id. Haldeman, Monogr. Limniades, p. 13, pl. 3, fig. 1 – 3.

Description. Shell very large, oval, inflated and rather solid. Whorls five, convex: body-whorl with very obvious vertical grooves, which are crossed by very fine and often obsolete lines. Spire short, rapidly diminishing, acute, often eroded. Suture deeply impressed. Aperture oblong-ovate, capacious. Fold on the columella well marked.

Color. Reddish or chesnut brown: epidermis rufous; within brownish or whitish. Animal blackish.

Length, 1·0 – 1·5.

This species agrees very well with the description assigned to it by Mr. Haldeman, with the exception of the surface of the shell, which, in my specimens, was marked by broad furrows or grooves more like his figure of *L. jugularis;* from which, however, it is sufficiently distinguished by its less elevated spire. It occurs near the shores of Lake Champlain. Not a common species.

Limnea gracilis.

PLATE IV. FIG. 73.

(STATE COLLECTION.)

Limnea gracilis. Say's Catalogue, pl. 1, fig. 10, 11.
L. id. Adams, American Journal of Science, Vol. 40, p. 267.
L. id. Haldeman, Monog. Limniades, p. 50, pl. 13, fig. 21.

Description. Shell fragile, very slender. Whorls four to six, flat, and very obliquely revolving. Suture distinct, deeply impressed. Body-whorl with minute incremental striæ. Pillar-lip unattached, without fold. Aperture oblong-oval, and rounded at both ends.

Color. Whitish and pearl grey. Animal unknown.

Length, 0·5 – 1·0.

This remarkable shell was discovered by Dr. Emmons in Lake Champlain, as yet its only ascertained locality. It is with hesitation that I refer it to this genus, from the absence of the oblique fold on the columella. The name of *Acella* as a subgenus has been proposed; but if my views are right, it must form a distinct genus intermediate between *Limnea* and *Physa*, or perhaps better at the end of the family.

Limnea humilis.

PLATE IV. FIG. 71. A. B.

(STATE COLLECTION.)

Limneus humilis. Say, Jour. Acad. Nat. Sc. Vol. 2, p. 378.
L. modicellus, var.? Id. Jour. Acad. Nat. Sciences, Vol. 2, p. 122.
L. modicella. Gould, Invertebrata of Mass. p. 218, fig. 151.
L. humilis. Haldeman, Monog. Limniades, p. 41, pl. 13, figs. 1–8.

Description. Shell ovate-conic. Volutions five to six, convex; the terminal one very minute. Aperture and spire subequal, oval, regular. Fold on the columella occasionally distinct.

Color, varying from pale reddish to brownish horn. Animal translucent, except the central portion, which is very light brown. Tentacles short, with a black point on the anterior basal edge.

Length, 0·2–0·4.

Found from Maine to South-Carolina inclusive. The typical form of this species, according to Mr. Haldeman, is short and thick, and such are found near the Susquehannah at Owego; the northern specimens are more slender, and form the variety described as *modicellus*.

Limnea reflexa.

PLATE IV. FIG. 72. A. B.—FIG. 65, VAR.

(STATE COLLECTION.)

Limneus reflexus. Say, Jour. Acad. Nat. Sc. Vol. 2, p. 167.
L. exilis. Lea, Am. Phil. Trans. Vol. 5, p. 114, pl. 19, fig. 82.
L. reflexa. Haldeman, Monog. Limniades, p. 26, pl. 8, figs. 1 and 8.

Description. Shell elongated, tapering, subacute. Whorls six to seven, flattened or slightly rounded, with transverse sinuous wrinkles, and very minute revolving lines. Suture deeply impressed, revolving very obliquely. Pillar-lip with a fold more or less distinct: lip everted at the base over the umbilicus, which is, however, distinct: apex polished.

Color. Brownish horn, becoming blacker towards the tip; occasionally covered entirely with a black epidermis. The young are amber-colored.

Length, 0·2–0·5.

The specimens illustrating this species were obtained near Fairfield, Herkimer county. Fig. 65 represents a specimen, nearly 0·8 in length, from the same locality.

Limnea linsleyi.

PLATE IV. FIG. 74. A. B.

(STATE COLLECTION.)

Description. Shell ovate, subventricose. Whorls five, rounded, and rapidly attenuated to the apex: suture deep. Aperture oblong-oval, longer than the spire. Pillar-lip with a broad calcareous deposit; the lower portion reverted, and partially covering the umbilicus. Lip thin, forming a shoulder at its junction with the preceding whorl. Body-whorl towards the margin of the outer lip, flattened as in *megasoma*, and impressed with deep incremental striæ which are evident from within.

Color. Epidermis chesnut, often obscured by a blackish subvillous pigment.

Length, 0·25. Aperture, 0·15.

This shell has affinities of form with *catascopium*, and more especially with the variety which is designated by Say as *L. pinguis*. That variety is, however, represented as having a moderate suture, and the whorls nearly four. I have ventured to impose upon it a new name, expressive of my obligations to the Revd. Mr. Linsley of Stratford, who furnished me with the specimens from his neighborhood.

Limnea columella.

PLATE IV. FIG. 75.

(STATE COLLECTION.)

L. columella. Say, Nich. Ency. Ed. Am. Vol. 4, No. 3. Jour. Acad. Nat. Sciences, Vol. 1, p. 14; Vol. 2, p. 167.
L. macrostomus. Id. Jour. Ac. Nat. Sc. Vol. 2, p. 170.
L. acuminata. Adams, Amer. Jour. of Science, Vol. 39, p. 374 (Young.).
L. columella, and var. *chalybea.* Gould, Invertebrata of Mass. p. 215, figs. 144, 145.
L. id. Haldeman, Monograph of Limniades, p. 38, pl. 12, figs. 1, 15.

Description. Shell ovate, ventricose, fragile, thin in texture, diaphanous: suture impressed and conspicuous. Whorls four, with incremental lines crossed by minute spiral striæ. Spire narrow, acute, and much shorter than the aperture. Aperture very large, more or less expanded. Pillar-lip with a thin film of enamel, not quite appressed anteriorly: it is so much arched as to display a considerable portion of the interior of the shell.

Color. Pale greenish, or straw-yellow.

Length 0·5 – 1·0.

This species has very much the aspect of a *Succinea*. Mr. Haldeman has very judiciously, as I think, united two nominal species into one. It abounds from Canada to South-Carolina. In this State, I have procured specimens from the locks at Schenectady, and throughout the western district.

Limnea emarginata.

PLATE IV. FIG. 77.

(STATE COLLECTION.)

L. emarginatus. Say, Jour. Acad. Nat. Sc. Vol 2, p. 170.
L. id. Id. American Conchology, pl. 55, fig. 1.
L. id. Haldeman, Monog. Limniades, p. 10, p.. 2, figs. 1 – 8.

Description. Shell ovate-conic, thin, translucent and smooth. Whorls five, convex, polished, with minute closely applied incremental lines: suture deep. Apex, when present, acute. Aperture wide, and more than half the entire length. Pillar-lip with the fold obsolete, and reflected in the adult so as to cover the umbilicus: columellar depression deeply emarginate.

Color. Light ochraceous or rufous brown; within yellowish white.

Length, 0·5 – 1·0.

Some varieties of this species, according to Haldeman, have the body-whorl marked with revolving divaricate lines, extending to the margin of the outer lip, which is undulated. A boreal species, extending from north of Lake Superior, through Maine, etc. to New-York. I am indebted to Dr. Charles Stillman for specimens from the Mohawk river.

Limnea desidiosa.

PLATE V. FIG. 78.

(STATE COLLECTION.)

Limneus desidiosus. Say, Journ. Acad. Nat. Sciences. Vol. 2, pp. 169 and 378.
L. id. Id. American Conchology, pl. 55, fig. 3.
L. acuta. Lea, Tr. Am. Phil. Soc. Vol. 5, pl. 19, fig. 81.
L. casta? Id. Tr. Am. Phil. Soc.
L. philadelphica. Id. Proceedings of same, Vol. 2, p. 32.
L. desidiosa. Adams, American Journ. Science, Vol. 40, p. 268.
L. id. Gould, Invertebrata of Mass. p. 219, fig. 150.
L. id. Haldeman, Monograph Limniades, p. 31, figs. 1 – 12.

Description. Shell subconic, somewhat inflated, thin and translucent. Incremental lines rather coarse. Surface with a tendency to form irregular facets. Whorls five, convex, with a deep suture; body-whorl much the largest. Spire about as long as the aperture. Aperture wide, generally obtuse behind; edge of lip nearly level. Pillar-lip thick, and not adpressed in front, but having a small umbilical aperture. Columellar fold not very distinct.

Color. Light chesnut or brownish: margin and submargin often dusky brown. Animal light yellowish grey, darkest on the middle: surface minutely dotted with whitish.

Length, 0·3 – 0·5.

Common between the parallels of 35° and 45°, and from the Atlantic to the Mississippi. I have specimens from various parts of the State, in rivulets and small lakes.

Limnea jugularis.

PLATE V. FIG. 81.

(STATE COLLECTION.)

L. jugularis. Say, Nich. Enc. Ed. Am.
L. stagnalis. Kirtland, Am. Jour. of Sci. Vol. 31, p. 35.
L. jugularis. Haldeman, Monog. Limniades, p. 16, pl. 4, figs. 1, 2.

Description. Shell large, thin, ventricose, smooth and diaphanous. Whorls six, slightly convex: incremental lines distinct. Spire regularly attenuated to an acute tip, rather shorter than the aperture. Aperture large; inner side subrectilinear; outer margin slightly expanded. Columella with a deep fold. No umbilicus, the last whorl being in close contact with the pillar-lip. *Color*, light ferruginous.

Length, 1·0 – 2·0.

This and the following (if they are not identical) are the largest species of the genus. I have received them from Lake Champlain and Canandaguia lake. They occur in Michigan, Northwest territory, and Lewis river, Oregon.

Limnea appressa.

L. appressus. Say, Jour. Acad. Nat. Sci. Vol 2, p. 168.
L. id. Adams, Am. Jour. of Sci. Vol. 40, p. 267.
L. id. Haldeman, Monog. Limniadæ, p. 18, pl. 5, figs. 1, 4.

Description. Shell elongated, ventricose. Whorls six. Spire regularly attenuated to an acute tip, which, as in the preceding, is rather shorter than the aperture. Body-whorl proportionally large. Aperture ample. Columella with the sinus of the fold profound. Callus perfectly appressed upon the shell to the base.

Color. Pale ferruginous, frequently stained with a black foreign matter.

Length, 1·0 – 1.5.

This species agrees so well in all its characters with the preceding, that it would be difficult to point out their specific comparative differences. The body-whorl of the present species appears to be more ventricose than in the preceding, the outer lip more expanded and dilated, and the apicial whorls are occasionally darker. None of these are confessedly sufficient to create specific differences. In Dr. Budd's collection, I have observed a specimen which might be referred to this species, 2·1 long, and its aperture 1·1. Specimens have been obtained by me from Cayuga and Champlain lakes.

(*EXTRA-LIMITAL.*)

L. obrussa. (Say. Ac. Sc. 5. 123. *L. decidiosa?* Hald. l. c. pl. 13, fig. 16 – 18.) Shell oblong, rather slender, pale yellowish, testaceous. Whorls five, slightly rounded; apex acute; suture deeply impressed; aperture not dilated, within pure white; columella with the sinus of the fold very obvious. Length, 0·4; diameter, 0·2. *Philadelphia.*

L. ferruginea. (Hald. l. c. p. 49, pl. 13, figs. 19 – 20.) Shell ovate-conic, thin. Whorls four, convex; suture and columellar fold distinct; aperture oval, as long as the spire; labium appressed, ferruginous. Length 0·3. *Oregon.*

L. rugosa, Val. (Hald. l. c. pl. 3, fig. 4 – 5.) Ovate-conic, thin. Whorls six, convex, with very coarse accretional lines; aperture elliptic, longer than the spire; columella reflected on the last whorl, so as to form a small umbilicus. *Color,* white, with a spiral fulvous band. *Mexico.*

L. attenuata, Say. (Hald. l. c. pl. 9, fig. 1 – 5.) Long and slender. Whorls seven, slightly convex, revolving obliquely; suture rather deep; apex suddenly pointed; aperture small and semicircular, sometimes expanded; fold on the columella well marked. Length, 1·0. *Color,* wood-brown. *Mexico.*

L. expansa. Hald. l. c. pl. 9, fig. 6 – 8. Pl. 36, fig. 348 of this work.) Short, smooth, translucent and fragile. Body-whorl inflated; spire rapidly attenuated to an acute apex, and as long as the aperture. Whorls five, somewhat flattened; suture shallow, but very distinct; aperture effuse; columellar fold deep and distinct. *Color.* brownish ochre-yellow. Length, 1·0. *Vermont.*

L. solida et *apicina,* Lea. (Hald. l. c. pl. 11, fig. 10 – 13.) Shell obtusely conical, smooth and umbilicate. Whorls 4 – 5, convex; suture deep; apex pointed; aperture polished, subovate; fold conspicuous only in the young. *Color,* pale bluish grey; aperture various shades of reddish brown; young ochraceous. Length, 0·5. *Oregon.*

L. bulimoides, Lea. (Hald. l. c. pl. 13, fig. 9 – 10.) Shell short, inflated, composed of about four convex whorls. Surface smooth and shining; lines of growth inconspicuous and undeviating, not crossed by spiral striæ; aperture as long as the spire, level, subround and slightly produced posteriorly; labium closely appressed, except anteriorly, where it forms a small umbilicus; columella without fold; spire generally much eroded; apex frequently truncated. *Color,* pale ochraceous, sometimes with reddish varicose bands. Length, 0·5. *Oregon.*

L. vitrea. (Hald. l. c. pl. 13, figs. 14 – 15.) Shell ovate, extremely thin and delicate. Surface smooth and polished; lines of growth very fine; labium with a well marked fold, and is not appressed anteriorly; spire short. Length, 0·5. *Ohio? Missouri.*

GENUS PHYSA. *Draparnaud.*

Animal oval, more or less spiral. Head with two long thread-like tentacles, with the eyes at their internal base. Mantle with two lobes, digitated on its margin, which can be reflected back so as to cover most of the shell. Foot long, rounded in front, pointed behind. In other particulars resembling *Limnea*, except that the orifices are usually on the left. Aquatic. *Shell*, often sinistral, oval, elongated or nearly globular, smooth, thin and fragile: aperture oval, rounded in front, narrowed and subangular beneath; pillar-lip somewhat twisted, but without fold: spire more or less elongated, always prominent.

PHYSA HETEROSTROPHA.

PLATE V. FIG. 82.

(STATE COLLECTION.)

Limnea heterostropha.	SAY, Nich. Encyclop. Vol. 4, pl. 1, fig. 6.
Physa id.	ID. Jour. Acad. Nat. Sciences, Vol. 1, p. 172.
P. id.	ADAMS, Am. Journ. Science, Vol. 40, p. 268.
P. id.	GOULD, Invertebrata of Mass. p. 213, fig. 142.

Description. Shell sinistral, subovate. Whorls four; the first large; the others small, terminating rather abruptly in an acute apex. Surface smooth, but under the lens exhibits very minute revolving and vertical lines: suture distinct. Aperture large, somewhat oval, three-fourths the length of the shell, or rather more. Lip a little thickened on the inside in adult animals.

Color. Yellowish or greenish yellow, becoming more dusky with age; inside of the lip dull reddish. *Animal*, olivaceous.

Length, 0·5 – 0·7.

A very common species in almost every pond and running stream. Often seen swimming rapidly in a reversed position at the surface of the water. Infested by a parasitic *Cercaria*.

PHYSA PLANORBULA.

PLATE V. FIG. 83.

(STATE COLLECTION.)

Bulla fluviatilis? SAY, Journ. Acad. Nat. Sciences, Vol. 2, p. 178.

Description. Shell small, thin and fragile, sinistral, cylindrical above, tapering beneath, abruptly truncated on the summit; apex very slightly elevated above the truncation. Whorls four; the surface smooth, with minute revolving lines crossed by others equally minute. Body whorl with an acute shoulder, the edge being slightly turned over. Aperture as long as the shell, narrow above, dilated beneath, and broadly rounded. Outer lip acute, thin, and reflected over the enlarged umbilicus. *Color*, light amber. Length, 0·2.

This singular shell was found by Mr. G. B. Clendining at the Cohoes falls, adhering to stones. I have adopted the name proposed by its discoverer. It was alive, and was destitute of an opercle. It is supposed by some conchologists to be a young Planorbis, but I cannot learn that it has been found in the intermediate stages. It is placed provisionally here; but if a perfect animal, must constitute a new genus. I am inclined to suspect that it is the animal described by Say as *Bulla fluviatilis*.

Physa cylindrica.

PLATE V. FIG. 83.

(STATE COLLECTION.)

Ph cylindrica. Newcomb, in literis.

Description. Shell remarkably solid, sinistral, cylindrical. Whorls four, rapidly diminishing to the subacute apex. Surface moderately smooth and polished, with incremental lines. Suture impressed: outer lip with a sinuous margin, nearly straight, forming an acute angle with the body, effuse beneath; body-whorl not convex, but rather flattened and cylindrical. Aperture narrow above, moderately dilated and elongated beneath. Columella smooth, arched with a conspicuous callus reflected over the umbilicus.

Color. Light rusty, or opake rusty white: outer lip with a rusty submargin within.

Length, 0·5; of aperture, 0·35.

This specimen was communicated by Dr. Newcomb, who obtained it from Red creek, Wayne county. I have received the same shell under the name of *P. elliptica*, Lea; but it does not agree with his description.

Physa elliptica.

Physa cylindrica. Lea, Trans. Am. Phil. Soc. No. 5, p. 115, pl. 19, fig. 83.

Description. Shell sinistral, elliptical, thin and fragile. Spire short, rapidly attenuating to the tip. Whorls four to five, with minute vertical striæ. Outer lip dilated, margined.

Color. Reddish brown, translucid; the apex amber-colored.

Length, 0·5; of aperture, 0·4. Diameter, 0·2 nearly.

According to Mr. Lea, found in various parts of the State.

Physa plicata.

PLATE V. FIG. 85.

(STATE COLLECTION.)

Description. Shell moderately solid, subovate, elongate, symmetrical. Whorls four to five, rapidly attenuated to the apex. Surface with equidistant, longitudinal, and obsolete inequidistant transverse raised lines: suture distinct. Pillar-lip with a broad nacreous deposit. Aperture rather more than two-thirds of the total length, acutely oval.

Color. Amber, but coated with a black pigment: before this is removed, the aperture is bluish iridescent.

Length, 0·6 – 0·8; of aperture, 0·2 – 0·3.

This description is from specimens of the largest size, obtained from a pond on New-York island. It moves, like *P. heterostropha*, with great celerity on the surface of the water, with its mouth downward. In some specimens the revolving and longitudinal lines are so distinct, particularly the former, that the surface of the body-whorl appears covered with distinct square facets. Some naturalists consider it only as a variety of *heterostropha*. It differs in many important particulars from that species, but I regret that I have not been enabled yet to examine the animal.

Physa obesa.

PLATE V. FIG. 86.

(STATE COLLECTION.)

Description. Shell ventricose; when young, very thin and fragile. Whorls four to five, rapidly attenuated to a minute and slightly elevated polished apex. Body-whorl inflated, with its upper surface near the suture depressed, and forming an obtuse angle with the lower portion: suture semicanaliculate. Surface polished, with minute incremental lines. Aperture elliptical.

Color. Pale horn.

Length, 0·5; of aperture, 0·4.

This species was communicated to me by Dr. Budd, who obtained it from the Mohawk and Hoosic rivers, Rensselaer county. I have since received from the same gentleman, specimens eight-tenths of an inch long, and quite solid, with a stout callus. Some naturalists who have seen it, are disposed to consider it as identical with the following.

Physa ancillaria.

PLATE V. FIG. 90.

Physa ancillaria. Say, Jour. Acad. Nat. Sci. Vol. 5, p. 124.
P. *id.* Adams, Am. Journal Science, Vol. 40, p. 268.
P. *id.* Gould, Invertebrata of Mass. p. 213, fig. 142.

Description. Shell heterostrophe, subglobose. Whorls rather more than four, very rapidly attenuated, smooth. Spire truncated, hardly elevated beyond the general curve of the surface. Suture not impressed, very inconspicuous. Aperture but little shorter than the shell, dilated. Lip a little thickened on the inner submargin.

Color. Pale yellowish, occasionally deep bay: submargin of the lip reddish. Animal lemon-yellow.

Length, 0·5 – 0·6.

This species occurs in Lake Champlain, and in other parts of the State. According to Prof. Adams, the young of this species are not easily distinguished from *P. gyrina*, although the mature specimens differ widely.

Physa gyrina?

PLATE V. FIG. 87.

(STATE COLLECTION.)

Physa gyrina. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 171.
P. *id.* Adams, American Journal of Science, Vol. 40, p. 268.

Description. Shell sinistral, solid. Subovate. Whorls five or six, slightly convex, not flattened, gradually tapering to an acute apex. Surface with minute incremental lines. Suture slightly impressed. Columella with a slight fold above, turned over beneath the reverted edge, and concealing the place of the umbilicus. Outer lip thin, acute. Aperture elongated, acute above, more than one-half and less than two-thirds of the length of the shell.

Color. Amber, often coated with a black pigment, except on the reflected portion of the inner lip, which is polished.

Length, 0·8; of aperture, 0·45.

The specimens which I place here, were obtained from the northern part of the State by Dr. Budd. They do not exactly coincide with any described species; they approach nearest to the descriptions of *P. gyrina*, which I have never seen. I have therefore placed it provisionally here, to avoid the necessity of making a useless synonime. I annex the characters assigned by Say to his *P. gyrina*. "Shell heterostrophe, oblong; whorls five or six, gradually acuminating to an acute apex; suture slightly impressed; aperture more than one-half, but less than one-third of the length of the shell; lip a little thickened on the inner margin. Length rather less than an inch. *Missouri.*"

Physa glabra.

PLATE V. FIG. 88.

(STATE COLLECTION.)

Description. Shell sinistral, smooth, shining, elongated, with five to six volutions: suture impressed: spire elongated into an acute apex. Body-whorl more than half of the total length. Aperture oblong, acute above, rounded beneath, and half of the total length. Columella sinuous, slightly reverted, with a faint oblique fold.

Color. Deep brownish orange, approaching to copper.

Length, 0·4; of aperture, 0·2.

This shell, for which I am indebted to Dr. Budd, who obtained it from Lake Champlain, appears in some collections under the name of *P. aurea*, which it resembles in nothing but color. It approaches *P. elongata*, but differs in its impressed suture and the form of its columella.

Physa aurea.

PLATE V. FIG. 89. A. B.

(STATE COLLECTION.)

Physa aurea. Lea, Trans. Am. Phil. Soc. Vol. 6, pl. 23, fig. 106.

Description. Shell sinistral, fragile, polished. Whorls four to five: suture very slightly impressed. Body-whorl longitudinally striate. Aperture moderate, four-tenths of an inch long. Lip thickened near the columella, and slightly folded near the umbilical region.

Color. Amber, varying to olivaceous and reddish brown.

Length, 0·6; diameter of aperture, 0·4 nearly.

These were obtained from West-Point, and were found diminishing in size to the length of three-tenths of an inch. Mr. Lea has described it as "sinistral, rather inflated, pellucid, shining; spire rather short; whorls four; outer lip margined; aperture somewhat inflated. *Color*, golden. Height, 0·5; diameter, 0.3. *Hot Springs, Virginia.*" I had described it in my notes as *P. fragilis*, but have concluded to arrange it here provisionally. It may be distinguished from *gyrina* and *elongata*, by the number of whorls, and proportional length of the aperture.

Physa elongata.

PLATE XXXVI. FIG. 346.

P. elongata. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 171.
P. id. Adams, Am. Journ. Science, Vol. 40, p. 269.
P. id. Gould, Invertebrata of Mass. p. 214, fig. 143.

Description. Shell sinistral, very fragile, diaphanous, oblong. Whorls six or seven, polished. Spire tapering, acute at tip. Suture slightly impressed. Aperture not dilated, attenuated above, about half as long as the shell. Columella much narrowed near the base, so that the view may be partially extended from the base towards the apex.

Color. Pale yellowish. Animal dusky: head above orange.

Length, 0·5 – 0·7. Diameter, 0·2.

Common from Maine westwardly: usually found in stagnant pools.

(*EXTRA-LIMITAL.*)

P. pomilia. (Conrad, Am. Jour. Vol. 25, p. 243.) Volutions four, polished; spire short, conical; body-whorl ventricose; aperture patulous. *Color*, corneous. *Alabama.*

P. integra. (Hald. Monog.) Shell oval, of five very convex whorls; apex pointed; suture very deep; aperture oval, wide posteriorly; peritreme continuous; no fold on columella. *Color*, pale, with white varicose bands. Length, 0·5. *Indiana.*

P. concolor. (Id. l. c.) Shell oval; spire produced, with the apex pointed; whorls four, convex; aperture oval, narrow; fold on the columella distinct. *Color*, honey-yellow. Length, 0·23. *Oregon.*

P. sayii. (Tappan, Wheatley's Catalogue.)

P. globosa. (Hald. Ac. Sc. Vol. 8, p. 200.) Shell globose, translucent; spire short and rounded; aperture very wide, occupying more than one-half of the entire area of the shell; fold well marked. Length, 0·3. *Virginia.*

SECTION OPERCULATED PULMOBRANCHIA.

Animal *provided with a foot for crawling. No gills, but a pulmonary cavity communicating externally with the air by a large solution of continuity placed above the head. Two tentacles. Generative organs upon different individuals. All terrestrial.* Shell *external, complete, spiral, globular or conic; a calcareous or horny opercle.*

Obs. None of this section are found in this or the adjoining States.

(*EXTRA-LIMITAL.*)

FAMILY CYCLOSTOMIDÆ.

ANIMAL *without a collar, and with two tentacles eyed at their external bases.* SHELL *conoid, more or less elevated, with the aperture rounded, and with its margin continuous.*

Genus CYCLOSTOMA, *Lam.* *Animal* very spiral, with a proboscis-like head bearing two cylindrical tentacles, swollen at their tips, contractile and eyed at their external bases. Foot oblong, elongated. Pulmonary cavity communicating externally by a large fissure in the upper and anterior part of the mantle. Place of the male organ indicated by a large tentacular appendix on the right side, and reflected into the pulmonary cavity. *Shell* conoid, discoid or turreted, more or less elevated. Aperture circular, entire, and in the adult reflected. Opercle calcareous, increasing concentrically: summit subcentral.

C. dentata. (SAY, Ac. Sc. Vol. 5, p. 125.) Shell conic, cylindric, truncate at tip. Whorls 3 – 4, slightly convex, cancellate with fine regular subequal longitudinal and transverse elevated lines; superior edge fimbriated, with prominences extending over the suture; lip somewhat reflected; umbilicus distinct. *Color*, rufous; revolving lines occasionally obsolete; lip white. Height, 0·4. *Florida.*

C. cincinnatiense. (LEA, Am. Phil. Tr. Vol. 8, p. 229, pl. 6, fig. 62. *A. sayana?* Anthony.) Shell elevated in the form of a cone, smooth, shining, transparent, umbilicate. Whorls 6; apex obtuse; margin of the lip reflected. Length, 0·22; diameter, 0·13. *Cincinnati.*

FAMILY HELICINIDÆ.

ANIMAL *with a collar; two filiform tentacles, with eyes at their external bases on tubercles.* SHELL *more or less globular; aperture entire, semioval; columella transverse and flattened; opercle horny.*

Genus HELICINA, *Lam.* *Animal* with a bilabiate muzzle; foot short, rounded, with a transverse furrow in front. Pulmonary cavity opening in front of the mantle by a large transversal furrow. *Shell* subglobular, slightly depressed, not umbilicated: spire low; columella callous; margin of outer lip acute, forming an angle at the base of the right margin.

H. orbiculata. (SAY, Am. Conch. pl. 46, fig. 1 – 3.) Subglobular; spire not very prominent, but more than convex. Whorls five, obsoletely striated across, regularly rounded; base of columella very slightly projecting into an obtuse angle; lip reflected. *Color*, pale greenish, yellowish or slightly reddish, margined above by a paler line; occasionally a pale revolving band on the body-whorl. *Florida.*

H. fastigiata. (ID. Des. terr. & fluv. shells, p. 14.) Whorls compressed, acutely carinated; beneath the carina, the elevated lines obsolete. Lip two-toothed; the lower conic, obtuse. Diameter, 0·35. *Illinois.*

H. plicata. (ID. l. c. p. 14.) Inferior tooth compressed, and larger than the other; duplicature of the labium emarginate near the tip. Closely allied to the preceding.

H. occulta. (ID. l. c. p. 15; Am. Conch. pl. 46, figs. 4, 6.) Whorls five, carinate, or with an acute shoulder, which is almost concealed on the spire by the suture, and almost obsolete on the body-whorl, which latter has faint revolving lines. Lip thick, a little reflected. *Western States.*

SECTION 5. PECTINIBRANCHIA.

ANIMAL *with gills arranged in parallel rows like the teeth of a comb, within the pulmonary cavity, which has a large opening in front and above, between the edge of the mantle and the body. Two eyes, variously placed, sometimes on pedicles. Sexes separate: the orifice of the female on the right side, at the entrance of, or within the branchial cavity; the male organ on the right side of the neck, usually very robust and reflected into the branchial cavity: vent anterior and on the same side. Tongue often armed with small hooks. Aquatic; usually marine; a few genera fluviatile.* SHELL *complete and spiral, variously shaped, almost always external, rarely internal. Opercle complete, rudimentary or none.*

OBS. This section, or order, as it stands in various works, comprises all the spiral univalves, and many that are simply conical; it is consequently the most numerous in species. It corresponds with the *Trachelipodes* of Lamarck, and the *Chismobranches* of Blainville. It has been subdivided into three groups, according as the water is introduced to the gills, 1, by a membranous appendage; 2, by a siphon; and 3, without either.

FAMILY TURBINIDÆ.

ANIMAL *with two subulate contractile tentacles; eyes at their base. Fluviatile or marine.* SHELL *variable in form. Aperture rounded or oval; the edges not disunited, or slightly so: without canal or emargination. Opercle horny or calcareous.*

GENUS PALUDINA. *Lamarck.*

Animal: Mouth without teeth, but having in its stead a small prickly lingual mass. Tentacles contractile. Foot oval, with a marginal furrow in front. Male organ very large, and retracted through an orifice in the right tentacle near its base. Vent at the extremity of a small tube near the branchial cavity. *Shell* conoidal, with an epidermis. Whorls rounded or convex: aperture rounded or oval, angulated above: margins of outer and inner lip united, with acute but not reflected edges. Opercle orbicular, horny.

OBS. The shells of the animals of this genus are distinguished from those of *Melania* by the simple curvature of the lip at the base, from *Cyclostoma* by its simple lip, and from *Valvata* by the form of its aperture. There are numerous species in the Western and Southern States, but very few as far north as this State.

Paludina disscisa.

PLATE VI. FIG. 131. A. B. — PLATE VII. FIG. 134.

(STATE COLLECTION.)

Paludina decisa. Say, Nich. Ency. pl. 2, fig. 6. Am. Conch. pl. 10.
P. ponderosa. Deshayes in Lam. (Young.)
P. decisa. Adams, Am. Jour. of Science, Vol. 40, p. 266.
P. id. Gould, Invertebrata of Mass. p. 227; fig. p. 144.
P. id. Haldeman, Monograph, p. 1, pl. 1.

Description. Shell ovate, elongate, thick and robust, often truncated at the apex. Whorls four to five, with minute transverse striæ and revolving lines, rounded, and briefly turning into the suture, which is distinctly impressed. Aperture subovate, entire, and forming an angle above. Lip simple, but forms a rounded margin as it rises towards the columella. Opercle coriaceous, thin, concentrically striate.

Color. Dark olive green. Aperture bluish white. *Animal:* Foot soiled olive, varied with orange; tentacles olive, spotted with orange.

Length, 1·0. Diameter, 0·7.

This is the most common species in this State, and found in most of the ponds and sluggish streams. The name originally given to it by Say, is evidently a misprint for *disscisa.*

Paludina integra.

PLATE VII. FIG. 132. A. YOUNG; B. ADULT.

(STATE COLLECTION.)

P. integra. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 176.
P. id. Haldeman, Monograph, etc. p. 10, pl. 3.

Description. Shell rather solid, conic. Whorls six, wrinkled across. Spire rather elongated, entire at the apex. Suture profoundly indented. Aperture subovate, rather more than half the length of the shell.

Color. Light olive green, tinged with rufous; the callus margined with blackish.

Length, 1·1; of aperture, 0·5.

Mr. Haldeman has given an excellent figure of this species, which was first described by Say from immature specimens collected in Missouri. The shells which are represented on the plate, were obtained from the River Hudson near Albany: they are among the largest measured. Farther south they appear to be larger still: the young shells, five-tenths of an inch long, are more globose. Mr. Cozzens has favored me with specimens from the River Passaic, which I refer to this species. They were obtained two miles and a half below the Acquaconock church. The Passaic here flows over a sandstone bed, highly charged with iron; the shells are more rufous and ponderous. In the adult, an obsolete carina on the

upper part of the body-whorl forms a sort of shoulder with the suture. Like other specimens of *disscisa*, the apex is often truncated, and some of the specimens were filled with young shells.

In my notes, I had marked specimens from Wolcott creek, Wayne county, as *P. heros*, with the following characters: "Shell subconic, solid; whorls 5 – 6, with moderate vertical wrinkles and revolving striæ, becoming few and obsolete on the body-whorl; suture very deeply impressed; apex depressed, polished; aperture subelliptic, narrowed above. *Color*, whitish, but covered with an olive-green epidermis; aperture within whitish, with a slight reddish or bluish hue. Length, 1·5; diameter across the aperture, 0·8." The enormous size of these specimens, and the absence of banded striæ except on the body-whorl, induced me at first to consider them as distinct; but on reëxamination, I refer them to this species.

Paludina isogona.

PLATE VII. FIG. 133.

(STATE COLLECTION.)

P. isogona. Say, Des. terr. and fluv. shells, p. 19.
P. pallida? Lea.

Description. Shell short, subglobose; surface polished with minute lines of growth. Whorls four or five, rounded, rapidly decreasing to the apex; body-whorl ventricose: suture distinct. Aperture oval, angulated above, reflected on the pillar-lip, partially concealing the umbilicus: outer lip slightly everted at the base. Aperture nearly twice the length of the spire. Apicial whorl minute, scarcely elevated.

Color. Olive-green.

Length, 0·25; of aperture, 0·15.

I have received specimens of *Paludina* from the western part of this State, labelled "*isogona*, Say;" which, I am informed, is identical with *P. pallida* of Lea. I have not been able to find descriptions of the latter; but to avoid burthening the systems with a new name, I prefer to adopt that assigned to it by Say.

(*EXTRA-LIMITAL.*)

P. transversa. (Say, Des. terr. and fluv. p. 20.) Shell transverse, depressed-orbicular: spire convex. Whorls three and a half, with numerous minute slightly elevated revolving lines; suture not widely indented; body-whorl very convex, short; umbilicus small. Opercle pale fulvous. Greatest width, 0·4. *Louisiana.*

P. intertexta. (Id. l. c. p. 20; Am. Conch. pl. 30, figs. 3 – 6.) Shell subglobose, wrinkled, and with minute, very numerous obsolete revolving deciduous lines: spire depressed, conic, obtuse, truncated, eroded at tip. Whorls nearly four; suture rather deeply indented; umbilicus closed by

the lateral extension of the columella. *Color*, yellowish green or brownish. Length, 1·0. *Louisiana.*

P. ponderosa. (Say, Am. Conch. pl. 30. Hald. Monog. pl. 4. *P. heterostropha*, Kirtland, Am. Jour.) Shell reversed, somewhat ventricose, much thickened: spire not much elongated, much shorter than the aperture, eroded at tip, but not truncated. Whorls 5, slightly wrinkled across; suture profoundly impressed; aperture subovate, more than half the length of the shell; pillar-lip with much calcareous deposit, and thickened into a callosity at the superior angle. *Color*, olivaceous. Length, 1·5. Allied to *disscisa. Falls of the Ohio.*

P. georgiana. (Lea, Am. Tr. Vol. 5, p. 116, pl. 19, fig. 85.) Shell ventricose, conical, thin, smooth: sutures very much impressed. Whorls about 5, convex: aperture nearly round. *Color*, dark horn; aperture white. Length, 1·1. Allied to *vivipara. Darien, Georgia.*

P. vivipara. (Say, Am Conch. pl. 10.) Shell subconic. Whorls 4, rounded; aperture suborbicular; sutures impressed. *Color*, olivaceous, with three reddish brown bands, of which the middle one is generally smallest; occasionally brownish, with fuscous bands: spire with but two bands. *South-Carolina.*

P. magnifica. (Conrad, Fr. Water Shells, p. 48, pl. 8, fig. 4.) Shell subovate, ventricose, with two spiral bands of prominent tubercles on the body-whorl, and one revolving near the base of each whorl of the spire; suture profoundly impressed, margined by an obtuse subnodulous prominent line; lines of growth oblique and prominent: obscure spiral striæ. *Color;* epidermis olive, often with purple bands. *Alabama.*

P. subpurpurea. (Say, Des. terr. &c. p. 21; Am. Conch. pl. 30, fig. 2.) Shell oblong, subovate, subglobular: spire rather obtuse, entire at tip, longer than the aperture. Whorls 5, slightly wrinkled across, rounded, not very convex; suture not deeply impressed; aperture ovate, orbicular, much widest in the middle, less than half the length of the shell; pillar-lip with a calcareous deposit. *Color*, variable, occasionally with traces of obsolete purplish bands. Length, 1·8; greatest breadth, 1·8. *Wabash.*

P. geniculata. (Conrad, loc. sup. cit. p. 48, pl. 8, fig. 3. Hald. pl. 5.) Shell suboval: spire slightly elevated. Whorls 4, scalariform; shoulders angulated; apex eroded; aperture rather more than half the length of the shell. Epidermis green olive; within bluish. *Georgia.*

P. subglobosa. (Say, Jour. Ac. Vol. 5, p. 125.) Shell subglobose. Whorls three and a half, much rounded, rapidly enlarging; suture profoundly impressed; aperture subovate; umbilicus very narrow, nearly closed by the lip: spire very short, convex. Length, 0·3. *Northwest Territory.*

P. dissimilis. (Say, Nich. Ency. No. 6.) Shell conic. Whorls about 3, with obsolete distant wrinkles, and an abrupt acute prominent carinated line, which revolves on the middle of the body-whorl, and is concealed on the spire by the suture, occasionally distinct; suture not indented; aperture oval, half as long as the shell: columella emarginate, a little flattened at the base. *Color*, dark horn or blackish; aperture rufous beneath the carina, and at base and apex. Length, 0·4. *Pennsylvania.*

P. lapidaria? (Cyclostoma *id.* Say, Nich. Ency.; Jour. Ac. 1, p. 13.) Shell turreted, subumbilicate. Whorls six, obsoletely wrinkled across; suture impressed; aperture longitudinally ovate-orbicular, operculated, rather more than one-third of the shell. Length, 0·2. Under stones. *Pennsylvania.*

P. subcarinata. (Say, Nich. Ency. p. 1, fig. 7. Hald. pl. 2.) Whorls three, rounded and subcarinate, reticulated with striæ and wrinkles (sometimes no striæ); suture deeply impressed; apex truncated and reentering; aperture oval, more than half the length of the shell: 2–3, and sometimes more, elevated lines or subcarina on the body. Length, 0·5; breadth, 0·4. *Pennsylvania.*

P. bimonilifera. (Lea, Am. Tr. Vol. 5, p. 58, pl. 19, fig. 71.) Shell obtusely turreted: apex obtuse. Whorls with two rows of nodules: those of the lower row of the upper whorls hidden by the suture; of the upper row larger, and visible on all the whorls: suture deep and irregular: outer lip subbiangular; base subangular. *Color*, dark horn. Height, 1·8; diameter, 1·1. *Alabama River.*

GENUS AMNICOLA. *Gould and Haldeman.*

Animal with the foot rounded behind, and each anterior angle laterally produced. Head half the breadth of the foot, and protruding beyond it. Tentacles short, filiform, unequal? Eyes at the side of the external base. Oviparous. Fluviatile. *Shell* ovate-conic, thin; spire acute, composed of a few rounded whorls; aperture small, oblique, rounded-ovate; lip continuous simple. Opercle horny, spiral, with a few volutions.

Obs. This genus has been established by Messrs. Gould and Haldeman, for the reception of a few small shells hitherto classed under *Paludina*, but with distinct habits. Its position seems to be between *Paludina* and *Melania.*

Amnicola lustrica.

Paludina lustrica. Say, Journ. Acad Nat. Sc. Vol. 2, p. 175.
P. *id.* Adams, American Journ. Science, Vol. 40, p. 267. *Valvata pupoidea?*

Description. Shell small, conic. Whorls slightly wrinkled, convex: suture profoundly indented; aperture oval, nearly orbicular; lip with the upper edge not appressed to the preceding whorl, but simply touching it: umbilicus rather large, rounded. Length, 0·1 nearly.

This very small species was first detected by Mr. Jessup, on the shores of Cayuga lake. It abounds also in the streams emptying into Lake Champlain.

Amnicola porata.

PLATE XXXV. FIG. 333.

Paludina porata. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 174.
Amnicola id. Gould, Invertebrata of Mass. p. 229, fig. 157.
A. id. Haldeman, Jour. Acad. Nat. Sciences, Vol. 8, p. 200.

Description. Shell very small, obtusely conic or subglobular, thin, smooth or with minute incremental lines. Whorls four, very convex, and flattened near the suture so as almost to present a shoulder: suture very deeply impressed; spire obtuse; aperture circular, the lip and pillar-lip being equally rounded, meeting above at a broad angle, the upper edge of the latter appressed to the preceding whorl; in the adult, barely touching the whorl just before it joins the outer lip, leaving a large and deep umbilicus.

Color. Olive-green, usually with a soiled coating of mud. Animal flesh-colored; tentacles silvery; eyes at the external base with a dark line extending along the tentacles. Length, 0·2.

First observed at Cayuga lake, but common almost every where in brooks and muddy streams, attached to submerged stones and plants. Allied to *A. limosa*, but is larger, less solid, more globose, and with a distinct umbilicus. Mr. Haldeman, in the work cited above, describes the shell as "very long and slender, with six obliquely revolving very convex turns, separated by a deep suture: aperture small, ovate, with the peritreme level and continuous, as in *Cyclostoma*." I cannot venture to reconcile these two descriptions.

(*EXTRA-LIMITAL.*)

A. limosa. (Say, Journ. Ac. Sc. Vol. 1, p. 125.) Shell conic, subumbilicate, obsoletely wrinkled; aperture ovate-orbicular; suture impressed. *Color*, dark horn, generally encrusted with a blackish coat. *Animal* whitish; head brown; mouth, tentacles, orbits and vitta on each side of the neck white; tentacles long and filiform: foot white, brownish above, short, suboval, truncated before, rounded behind. Length, 0·1. *Delaware.*

A. grana. (Say, l. c. Vol. 2, p. 378.) Shell conic-ovate. Whorls convex, not perceptibly wrinkled; suture deeply impressed; aperture orbicular, hardly angulated above; pillar-lip with the outer edge appressed to the surface of the penultimate whorl; umbilicus rather small, profound. Allied to *lustrica*, but smaller. Length, 0·08. *Pennsylvania.*

A. cincinnatensis. (Anthony, Bost. Jour. Vol. 3, p. 279, pl. 3, fig. 1.) Shell somewhat ventricose, subumbilicate. Whorls four, smooth; spire prominent and entire at the apex; suture deeply impressed; aperture much dilated, approaching to orbicular, nearly half the length of the shell *Color*, green. Length, 0·2. *Cincinnati.*

A nichliniana, Lea.

GENUS MELANIA. *Lamarck.*

Animal with a proboscis-like rostrum, semicylindrical, slightly notched in front; tentacles filiform; foot oval and very large; mantle festooned in front and on the left. *Shell* turreted, rather thick, and covered with an epidermis. Aperture acute, oblong, entire, effuse at the base. Lip simple, acute, prominent near the base, and rather abruptly retracted at its junction with the base of the columella, and not united above to the pillar-lip. Columella smooth, incurved. No umbilicus. Opercle corneous, spiral.

Obs. These animals are most numerous in Asia and America. In Europe they are only found in a fossil state. In this country, more than one hundred species have been described, almost exclusively from the Western and Southern States. In the first edition of Lamarck, (*Animaux sans vertèbres*), among the sixteen living species described, only one is attributed to North-America. The chief laborers in this genus are Messrs. Say, Conrad, and more especially Mr. Lea, who alone has added more than fifty species, all of which are beautifully figured in the *Transactions of the American Philosophical Society*. As the species are very numerous, Mr. Lea has arranged them under nine divisions, according as they are smooth, plicate, carinate, sulcate, striate, tuberculate, granulate, cancellate or rugose.

Melania depygis.

PLATE VII. FIG. 135. A. B. Variety.

(STATE COLLECTION.)

M. depygis. Say, Des. terr. & fluv. shells, p. 19; Am. Conch. pl. 8, figs. 4, 5.
M. id. Adams, American Jour. Science, Vol. 40, p. 366.

Description. Shell oblong, conic-ovate, not remarkably thickened. Spire longer than the aperture, often much eroded, with a broad revolving band near the suture, occupying more than half the surface. Whorls about five, hardly rounded, and in the adult nearly flat. Suture moderately impressed. Aperture ovate-acute above, moderately dilated. Lip not projecting near the base, nor arched near its junction: base regularly rounded.

Color. Body-whorl rufous or yellowish, with two equidistant revolving rufous lines, of which the upper is broadest.

Length, 0·5 – 0·9; of aperture, 0·3 – 0·4.

Var. A. Dark brown bands obsolete.

Var. B. Large, with coarse folds on the body-whorl.

I have received this species from the Brimstone springs west of Geneva, and it doubtless occurs in various other parts of the State. The whorls of these are of a dark horn-color, and the sutures whitish, often entirely covered with a calcareous coating. Prof. Adams detected it in Lake Champlain, and remarks that it is the only species yet observed in the States east of the Hudson river.

Melania niagarensis.

Melania niagarensis. Lea, Tr. Am. Phil. Soc. Vol. 8, p. 173, pl. 5, fig. 21.

Description. "Shell smooth, obtusely conical, thick, horn-colored; spire short; sutures linear; whorls rather flat; aperture rather large, elliptical, within purple." This shell, Mr. Lea states, has hitherto been confounded with *M. depygis;* but according to that author, is smaller, with a shorter spire and a narrower aperture. It has a purple columella and interior, which in some cases are very dark; the number of whorls is either six or seven, but all the specimens were more or less eroded, and the apex removed: the aperture is nearly half the length of the shell.

Length, 0·55. Diameter, 0·25.

Melania virginica.

PLATE VII. FIG. 141.

(STATE COLLECTION.)

Paludina virginica. Say, Nich. Ency. Ed. Am. Vol. 3, pl. 2, fig. 4.
Melania id. Id. American Conchology, pl. 47, fig. 2.

Description. Shell tapering, elongate, often eroded at the tip. Whorls seven, but little rounded, almost flattened, crossed by curved wrinkles on the spire and reclivate ones on the body; aperture subovate; lip a little prominent towards the base.

Color. Dull olive or black. A dull reddish line revolves near the base of the whorls, and another near or upon the middle: occasionally destitute of the revolving bands.

Length, 0·5 – 1·0; of aperture, 0·2 – 0·3.

This species varies so much with its locality and different stages of growth, that it is exceedingly difficult to seize upon any distinctive character applicable to its various phases. I have seen some specimens from the River Raritan, of a deep jet black varied with rufous. I am not sure but that the following, with some, may be considered as a mere variety of this species.

Melania bizonalis.

PLATE VII. FIG. 140. A. B.

(STATE COLLECTION.)

Description. Shell tapering, elongated. Whorls seven or eight, flattened; the upper whorls with a revolving strongly carinated line just above the suture, and above this two slightly but distinctly elevated revolving lines; all the volutions with sinuous vertical elevated lines becoming obsolete towards the tip. Aperture subovate, angular above, and uniting with a broad white callus on the pillar-lip: tip rarely perfect.

Color. Olivaceous-brown. Epidermis with two and rarely three dark reddish revolving lines on the body-whorl, often indistinct, but may be traced.

Length, 0·7; of aperture, 0·23. Width of the same, 0·16.

For this species I am indebted to Dr. Emmons, who found it abundantly in Lake Champlain. It approaches *M. virginica*, but, as I view it, very distinct by its flattened whorls and deep angular sutures.

Melania gemma.

PLATE VII. FIG. 142.

(STATE COLLECTION.)

Description. Shell moderately large, oblong: spire attenuated, acute; the whole surface covered with waved vertical wrinkles. Whorls eight, all distinctly carinate near the middle, and very acutely so on the apicial whorls; on the lower whorls this carina is below the middle, but becomes medial above; in some specimens, the lower whorls are bicarinate, or rather the carina is slightly furrowed on its edge. Suture deep, occasionally cancellate. The body-whorl has one or more rounded grooves on each side of the carina, which produces corresponding minute elevated ridges. Lip fragile; its margin convex, rarely perfect.

Color. Variable from straw-yellow to amber and dark reddish brown; columella often purple; lower sutures opake white.

Length, 0·7 – 1·2; of aperture, 0·23.

This species was obtained from Mud creek, Onondaga county, by Dr. Budd, and was at first referred to the *semicarinata* of Say, hitherto supposed to be an exclusively western species. An attentive examination and comparison of Say's description with this, will exhibit strongly marked differences. It is larger; all the volutions are carinate, and the sutures distinctly cancellate. I have received others from the Erie canal, much larger, being more than an an inch long. In these the revolving groove, in descending, gradually approaches nearer the suture, and is continued on the body-whorl, which is vertically rugose. In my catalogue of species, I had named this species after its discoverer; but the practice has been so much abused that it is daily becoming obsolete. I trust that the name now proposed will readily suggest that of the gentleman to whom I have been under many obligations in this department.

Melania subularis.

PLATE VII. FIG. 138.

(STATE COLLECTION.)

M. subularis. Lea, Trans. Am. Phil. Soc. Vol. 4, p. 100, pl. 15, fig. 30.

Description. Body elevated, with an acute spire, regularly attenuated from the body-whorl. Whorls ten to twelve, quite flat; base angular; outer lip not regularly rounded; suture subcancellate.

Color. According to Mr. Lea, horn-color; in my specimens, the centre of the whorl had a broad revolving rufous band, becoming darker towards the tip: vicinity of the sutures chalky white.

Length, 0·7 – 1·2; of aperture, 0·2 – 0·3.

This species occurs along the shores of Lake Erie. In the numerous specimens which I collected, I was not fortunate enough to obtain a single perfect collection, and am indebted to Mr. Lea for a portion of the figure.

(*EXTRA-LIMITAL.*)

M. undulata. (Say, Des. terr. and fluv. shells, p. 17.) Shell large, elevated conic. Whorls 8, not convex: suture not impressed, hardly obvious, undulated by revolving the inferior crenate boundary of the impressed band; the superior boundary of the band elevated and sometimes nodulous. Lip near the base, much protruded; sinus very obtuse. *Color*, brown. Allied to *canaliculata*. Length, 1·5. *Ohio river.*

M. hildrethiana. (Lea, Tr. Am. Phil. Vol. 8, p. 164, pl. 5, fig. 1.) Shell smooth, fusiform, rather thick: spire short, pointed; sutures deeply impressed. Whorls 5, convex: aperture large, angular at base, ovate. *Color*, horn-colored externally; aperture white or purple. Length, 0·37; width, 0·25. *Ohio river near Marietta.*

M. castanea. (Lea, l. c. pl. 5, fig. 2.) Shell smooth, club-shaped, rather thin. Whorls 8, somewhat convex: sutures small; spire elevated, carinated towards the apex. *Color*, dark brown; aperture purple. Length, 0·67; width, 0·25. *Tennessee.*

M. lævis. (Id. l. c. pl. 5, fig. 3.) Shell smooth, obtusely conical, rather thin, shining. Whorls 7, rather convex; sutures linear; spire rather short, carinate towards the apex; aperture rather large, more than one-third of the total length, elliptical, angular at base. *Color*, yellowish; aperture whitish. Length, 0·55; diameter, 0·25.

M. kirtlandiana. (Id. l. c. pl. 5, fig. 4.) Shell smooth, acutely conical, rather thick, shining. Whorls 9, rather convex: sutures impressed; spire elevated, carinated towards the apex. Length, 0·87; width, 0·3. *Indiana, Ohio.*

M. taitiana. (Id. l. c. pl. 5, fig. 5.) Shell smooth, conical, rather thin, shining. Whorls rather convex: suture impressed; spire truncate, carinate towards the apex; aperture small, elliptical, subangular at base. *Color*, horn, often with revolving bands. Length, 0·8; diameter, 0·25. *Alabama.*

M. dubiosa. (Id. l. c. pl. 5, fig. 6.) Shell smooth, conical, rather thin. Whorls 7, somewhat convex: sutures linear; spire rather elevated; aperture elliptical, subangular at the base, rather more than one-third of the total length. Allied to *M. simplex* of Say. *Color*, horn; aperture whitish. Length, 0·75; diameter, 0·3. *Tennessee.*

M. ebenum. (Id. l. c. pl. 5, fig. 7.) Shell smooth, obtusely conical, thick: spire obtuse; sutures small; whorls somewhat convex; aperture rather large, ovate, subangular at base. *Color*, black or bluish; aperture purplish. Length, 0·47; diameter, 0·3. *Tennessee.*

M. rufescens. (Id. l. c. pl. 5, fig. 8.) Shell smooth, turreted, rather thin, shining: spire elevated; sutures impressed; whorls 8, convex, carinate towards the apex; aperture small, elliptical, subangular beneath. *Color*, dark red; within purplish. Length, 0·85; diameter 0·3. *Tennessee.*

M. tuberculata. (*M. stygia*, Say, Am. Conch. Lea, l. c. Vol. 4, pl. 15, fig. 31.) Shell robust, conic-ovate: spire rather larger than the aperture, eroded at the tip. Whorls 5, hardly convex; wrinkles obsolete, except a few larger ones; aperture narrowed at base into a slight sinus, and subangulated, much widest in the middle; lip much arched in the middle. *Color*, black. Resembles *armifera*, but that shell has tubercles and colored lines. Length, 0·75. *Tennessee.*

M. armigera. (Say, Ac. Sc. Vol. 2, p. 178.) Shell tapering. Whorls about 6, slightly wrinkled: spire near the apex, eroded; body-whorl with a revolving series of 5 – 6 distant prominent tubercles, which become obsolete on the spire, and are concealed by the revolutions of the succeeding whorls: hence an appearance of a small subsutural series of tubercles on the body-whorl. Columella with a distinct sinus at the base. *Color*, brownish horn, with two or three obsolete revolving reddish brown lines; apex whitish. Length, 1·0. *Ohio river.*

M. hydei. (Conrad, Fr. Wat. Shells, pl. 8, fig. 1.) Shell conical, rather elevated. Whorls flattened, with spiral acute tuberculated lines: one or two on each whorl of the spire, and about four on the body-whorl; the inferior one plain: aperture elliptical. *Alabama.*

M. catenaria. (Say, Ac. Sc. Vol. 2, p. 379.) Shell conic. Whorls 7 – 8, slightly undulated transversely, and with 8 – 9 revolving elevated lines, the four or five superior ones of which are almost interrupted between the undulations. *Color*, blackish. Length, 0·45. *South-Carolina.*

M. cancellata. (Say, Des. terr. etc. p. 16.) Shell rather slender, attenuated. Whorls convex, with about twenty-six reclivate longitudinal elevated lines crossed by about eighteen revolving ones, the eight or nine towards the base crowded. Length, 0·8. Allied to *catenaria*, but more elongated and attenuated. *Florida.*

M. fusiformis. (Lea, Tr. Am. Phil. Soc. Vol. 8, p. 167, pl. 5, fig. 9.) Shell smooth, fusiform, rather thin, pointed at the apex: spire short; sutures linear; whorls 6, the last large and inflated; aperture ovately elongated. *Color*, yellow; aperture whitish. Length, 0·5; diameter, 0·27. *Tennessee.*

M. clavæformis. (Id. l. c. pl. 5, fig. 10.) Shell smooth, shining, club-shaped, rather thin: spire acute; sutures somewhat impressed; whorls eight, convex; aperture elongated. *Color*, chesnut brown; aperture light purple. Length, 0·67; diameter, 0·27. *Tennessee.*

M. gracilis. (Id. l. c. pl. 5, fig. 11.) Shell smooth, club-shaped, rather thin. Whorls 8, convex: spire acute; sutures impressed; aperture small, ovate. *Color*, horn; aperture white. Length, 0·75; diameter, 0·32. *Tennessee.*

M. subsolida. (Id. l. c. pl. 5, fig. 12.) Shell smooth, subfusiform, somewhat solid; spire acute; sutures impressed; whorls subconvex; aperture subelongated. *Color*, horn; aperture purple, white on the margin. Length, 0·82; diameter, 0·32. *Tennessee.*

M. ocoeënsis. (Id. l. c. pl. 5, fig. 13.) Shell smooth, conical, somewhat thick; spire obtuse, lined towards the apex; sutures impressed; whorls somewhat convex; aperture small, ovate. *Color*, dark-horn; aperture bluish. Length, 0·92; diameter, 0·32. *Tennessee.*

M. subcylindracea. (Id. l. c. pl. 5, fig. 14.) Shell smooth, subcylindrical, club-shaped, somewhat thick; spire obtusely elevated; sutures impressed; whorls convex; aperture small, one-third of total length, ovate. *Color*, horn; aperture whitish. Length, 0·85; diameter, 0·32. *Tennessee.*

M. sordida. (Id. pl. 5, fig. 15.) Shell smooth, conical, somewhat thick; sutures impressed; whorls somewhat convex; aperture rather large, somewhat rounded. *Color*, dark horn; aperture bluish. Closely resembling *M. ocoeënsis.* Length, 1·02; diameter, 0·4. *Tennessee.*

M. regularis. (Id. pl. 5, fig. 16.) Shell smooth, conical, rather thick; spire elevated; sutures somewhat impressed; whorls 10? flat; aperture small, one-quarter of total length. *Color*, dark horn. Length, 1·22; diameter, 0·4. *Tennessee.*

M. fuliginosa. (Id. pl. 5, fig. 17.) Shell smooth, fusiform, subinflated, rather thick; spire obtuse; sutures impressed; whorls six, somewhat convex; aperture large, angular at base and channelled. *Color*, dark brown. Length, 0·85; diameter, 0·5. *Tennessee.*

M. alveare. (Conrad, Fr. Wat. Shells, p. 54, pl. 4, fig. 7.) Shell short, conical, ventricose. Whorls flattened, with a line of wide compressed tubercles at the base of the penultimate whorl: body-whorl angulated; angle armed with prominent tubercles; base hardly convex, with about five prominent lines; aperture obliquely elliptical, less than half the length of the shell. *Alabama.*

M. annulifera. (Conrad, op. cit. p. 51, pl. 8, fig. 2.) Shell subelevated, subconical, with flattened whorls, and elevated distant ribs, alternately smaller; about five on the body-whorl, and three on the adjoining one: suture obsolete. *Color*, usually blackish without and purplish within. *Black-warrior river, Alabama.*

M. biteniata. (Conrad, op. cit. p. 52, pl. 8, fig. 6.) Shell conic, with convex whorls; spires short: one whorl entire, very convex; apex eroded; columella with a callus above, and another near the base; aperture half the length of the shell. *Color*, olive, with two broad purple bands on the body-whorl, and one on the contiguous whorl; within bluish with purplish bands. *Alabama.*

M. canaliculata. (Say, Ac. Sc. Vol. 2, p. 175. *M. sayi*, Conrad, p. 50.) Shell tapering. Whorls about seven, slightly wrinkled: spire towards the apex, much eroded. Body with a large groove which is obsolete upon the whorls of the spire, from the revolution of the suture on its lower margin; hence the upper margin only of the groove is seen in the form of an obtuse carina. Lip slightly undulated by the groove, and with a distinct sinus at the base of the columella. *Color*, brownish horn; aperture bluish white, with one or more ob-

solete revolving reddish lines. Length, 1·1; diameter, 0·4. One of the largest of the genus. *Ohio.*

M. conica. (Say, Ac. Sc. Vol. 2, p. 176.) Shell conic, rapidly attenuating to an apex, very slightly wrinkled: suture not deeply impressed. Whorls 7 – 8; aperture oblique, equalling the second, third and fourth whorls together. *Color*, olivaceous, occasionally with one to three revolving rufous or blackish lines. Length 0·6. An *anculotus ? Ohio river.*

M. nickliniana. (Lea, Am. Phil. Tr. Vol. 8, p. 171, pl. 5, fig. 18.) Shell smooth, obtusely conical, solid; sutures impressed; whorls six, slightly convex; aperture large, somewhat rounded. *Color*, very dark, occasionally banded; aperture purple. Length, 0·45; diameter, 0·27. *Virginia.*

M. viridis. (Id. l. c. pl. 5, fig. 19.) Shell smooth, subfusiform, rather thick; spire short, obtusely conical; sutures linear; whorls 5, somewhat convex; aperture ovate, rather large. *Color*, green; aperture white. Length, 0·32; diameter, 0·27. *Ohio.*

M. occidentalis. (Id. l. c. pl. 5, fig. 20.) Shell smooth, subglobose, rather thick; spire short, pointed; sutures linear; whorls four, rather convex, occasionally with raised revolving striæ; aperture large, ovate, nearly three-quarters of the total length. *Color*, green; within purple or white. Closely allied to the *M. subglobosa* of Say. Length, 0·37; diameter, 0·3. *Ohio.*

M. globula. (Id. l. c. pl. 5, fig. 22.) Shell very small, smooth, subglobose; spire short; sutures impressed; whorls four, rather convex; aperture large, nearly two-thirds of total length, nearly round. *Color*, dark brown, with two darker revolving bands; aperture bluish. Length, 0·25; diameter, 0.22. *Tennessee.*

M. altilis. (Id. l. c. pl. 5, fig. 23.) Shell smooth, subglobose, thick; spire short; sutures small; whorls four, obtusely angular above; aperture large, nearly round. *Color*, pale horn. Length, 0·32; diameter, 0·27. *Maryland, South-Carolina.*

M. strigosa. (Id. l. c. pl. 5, fig. 24.) Shell smooth, acutely turreted, thin, striate above; spire drawn out; sutures impressed; whorls 9, flattened; aperture small, elliptical, angulated at the base. *Color*, pale yellow; bluish within. Length, 0·85; diameter, 0·27.

M. virgata. (Id. l. c. pl. 5, fig. 25.) Shell smooth, rounded, rather thin, shining; spire short; sutures linear; whorls convex; aperture half the total length, elliptical. *Color*, yellow, with two broad bands. Length, 0·3; diameter, 0·2. *Tennessee.*

M. tenebrosa. (Id. l. c. pl. 5, fig. 26.) Shell smooth, conical, rather thick; spire rather elevated; sutures impressed; whorls flattened; aperture rather large, elliptical, angular at the base. *Color*, nearly black; within bluish. Length, 0·72; diameter, 0·3. *Tennessee.*

M. cincinnatensis. (Lea, Am. Jour. Vol. 38, p. 175; Am. Phil. Tr. Vol. 8, p. 190, pl. 6, fig. 58.) Shell minute, much depressed, compressed beneath, bicarinate, with an acute apex; whorls four; aperture subrounded. *Color*, fuscous, trifasciate. Length, 0·16; diameter, 0·14. *Cincinnati.*

M. comma. (Conrad, op. cit. pl. 8, fig. 7.) Shell subulate, much elongated, slender. Whorls 8 – 9, flattened, indented at the sutures, with longitudinal distant slightly arcuated ribs, disappearing on the lower whorls; lip thin; aperture elliptical, produced at the base. *Color*, olive, with a dark band above the middle of each whorl. *Alabama.*

M. congesta. (Id. Am. Jour. Vol. 25, p. 343.) Shell subulate, with about nine volutions, the lower ones obscurely angulated, those of the spire acutely carinate towards the apex: suture well defined; body-whorl obscurely angulated; aperture longitudinally elliptical. *Alabama.*

M. elevata. (Say, Ac. Sc. Vol. 2, p. 176. *M. elongata?* Lea, Am. Tr. Vol. 4.) Shell gradually attenuating to the apex, slightly and irregularly wrinkled; suture not deeply impressed. Whorls 9 – 10, with several more or less elevated revolving lines, of which one being more conspicuous, gives the shell a carinated appearance. Aperture oblique, equalling the length of the 2d, 3d and 4th volutions together. *Color*, olivaceous. Length, 1·0; breadth, 0·4. *Ohio river.*

M. excurata. (Conrad, Fr. Wat. p. 49, pl. 4, fig. 6.) Shell subulate, with a spiral band of slightly oblique subcompressed tubercles on the base of the inferior whorls: above this, a prominent line with a slight intervening channel. Whorls towards the apex nearly entire: base with 3 prominent lines; the upper ones largest; the third hardly prominent, and approximating to the middle one. *Color:* epidermis reddish brown or black. *Alabama.*

M.? integra. (Say, Des. terr. and fl. shells, p. 18.) Subglobose. Whorls 3, rounded, obsoletely wrinkled; spire very short, less than half the length of the aperture; suture rather deeply impressed; body-whorl large; aperture dilated, ovate, acute above; columella flattened, polished; lip regularly rounded; base rounded, without undulation or sinus; umbilicus none; opercle obviously spiral. Length, 0·2. *Ohio river.*

M. teres. (Lea, Tr. Am. Phil. Soc. Vol. 8, p. 176. pl. 5, fig. 27.) Shell plicate or folded, acutely turreted, thin: spire drawn out; sutures impressed; whorls 9, convex; aperture small, elliptical. *Color*, horn; white within. Length, 0·87; diameter, 0·25. *Tennessee.*

M. obtusa. (Id. Ib. pl. 5, fig. 28.) Shell folded, fusiform, rather thick: spire obtuse; sutures impressed; whorls 4, the last semiplicate; aperture large. Length, 0·55; diameter, 0·27. *Tennessee.*

M. lecontiana. (Id. Ib. p. 177, pl. 5, fig. 29.) Shell folded, conical, thick: spire obtusely elevated; sutures small. Whorls 6, flattened; lower half of body-whorl not folded: aperture large, nearly one-half of total length, elliptical. Length, 0·8; diameter, 0·35. *Georgia.*

M. rugosa. (Id. Ib. pl. 5, fig. 30.) Shell folded, conical, rather thin, translucent, transversely striated: spire rather elevated; sutures much impressed; whorls seven, convex, cancellated above; aperture rather large, elliptical, angular below. *Color*, horn. Length, 0·5; diameter, 0·22. *Tennessee.*

M. monozonalis. (Id. Ib. pl. 6, fig. 31.) Shell folded, fusiform, rather thick: spire obtuse; sutures linear; whorls 5, rather convex; aperture large, about one-half the total length, elliptical. *Color*, light-colored, with a simple broad band on the upper part. Length, 0·42; diameter, 0·21. *Tennessee.*

M. terebralis. (Id. Ib. p. 178, pl. 6, fig. 32.) Shell folded, acutely turreted, rather thin, shining: spire much elevated; sutures much impressed; whorls 9, convex, carinate above; aperture small, about one-fifth of the total length. *Color*, reddish brown. Length, 0·67; diameter, 0·24. *Tennessee.*

M. columella. (Id. Ib. p. 179, pl. 6, fig. 33.) Shell obscurely folded, conoidal, rather thin: spire rather elevated, striate above; suture impressed; whorls six, somewhat compressed;

aperture about one-third of total length, elliptical, angular at base; columella with an impressed curve. *Color*, horn. Length, 0·63; width, 0·26. *Tennessee.*

M. blanda. (Id. Ib. pl. 6, fig. 34.) Shell folded, conoidal, rather thin, shining: spire rather elevated, striate above; sutures impressed; whorls 7, rather flattened; aperture one-third of total length, elliptical, angular at base. Length, 0·69; diameter, 0·26. *Tennessee.*

M. crebri-costata. (Id. Ib. pl. 6, fig. 35.) Shell with numerous slightly curved folds, except on lower half of body-whorl, conoidal, rather thick: sutures linear; whorls 7, flattened; aperture about one-third of the total length, elliptical, angular below. *Color*, horn; mouth bluish. Length, 0·9; diameter, 0·28. *Tennessee.*

M. laqueata. (Say, op. cit. p. 17; Am. Conch. pl. 47, fig. 1.) Shell oblong-conic: spire longer than the aperture, elevated, acute at tip. Whorls moderately convex, with about seventeen regular elevated equal equidistant costæ on the upper half of each whorl, extending from suture to suture, but little lower on the spire, and obsolete on the body-whorl; suture moderately impressed; lip and columella a little extended at base; sinus obsolete. Length, 0·8. *Tennessee.*

M. lima. (Conrad, Fr. Wat. Shells, p. 54, pl. 8, fig. 8.) Shell conic or subfusiform, with approximate nodulous spiral lines of unequal size: body-whorl angulated, with a series of prominent tubercles; base with two lines, the upper one nodulous; aperture nearly half the length of the shell, contracted and acutely angular above, and obtusely pointed at the base; lip very thin. *Color*, olive within, with purple bands. *Alabama.*

M. multilineata. (Say, Ac. Sc. Vol. 2, p. 380; Am. Conch. pl. 47, fig. 1.) Shell gradually tapering; apex generally much eroded: whorls about seven, a little curved, with numerous filiform elevated subequal lines which are from 10 – 20 in number. Length, 0·9; width, 0·4. Allied to *elevata*, but the whorls are convex and the lines more numerous. *Pennsylvania, New-Jersey.*

M. nupera. (Say, Des. etc. p. 16; Am. Conch. pl. 8, fig. 1.) Shell oblong, suboval. Whorls five, slightly rounded: body-whorl with one or more revolving series of subequal equidistant tubercles on its upper part; second volution with two series, the others with slightly elevated longitudinal lines; aperture longer than the spire, which is often decorticated; suture not deeply impressed; sinus of upper angle profound; lip concave, with a callus near the upper angle. Length, 0·8. *Wabash river.*

M. nassula. (Conrad, op. cit. p. 55, pl. 8, fig. 9.) Shell elevated. Whorls convex or subangulated, with longitudinal ribs crossed by numerous spiral elevated lines; about seven on the penultimate whorl, and about eleven on the body-whorl: suture impressed; apex much eroded. *Alabama.*

M. curreyana. (Lea, Am. Phil. Trans. Vol. 8, p. 180, pl. 6, fig. 36.) Shell strongly folded, conoidal, rather thick: spire rather elevated; suture irregularly impressed; whorls seven, subconvex; aperture about one-third of the total length, angular below, *Color*, horn; purplish within. Length, 0·73; diameter, 0·27. *Kentucky.*

M. edgariana. (Id. Ib. pl. 6, fig. 37.) Shell folded, conoidal, transversely striate, rather thin: whorls eight, rather flattened; aperture rather more than one-fourth the total length, elliptical, angular below. *Color*, yellowish brown; within bluish. Length, 0·77; diameter, 0·29. *Tennessee.*

M. decora. (Id. Ib. p. 181, pl. 6, fig. 38.) Shell folded except on the two lowest whorls, acutely turreted, rather thin, striate above: spire acute, elevated; sutures impressed; whorls nine, rather flattened; aperture small, elliptical. *Color*, horn; within whitish. Length 0·82; diameter, 0·26. *Tennessee, Kentucky.*

M. costulata. (Id. Ib. pl. 6, fig. 39.) Shell folded, conoidal, rather thin, carinate above: spire rather elongated; sutures impressed; whorls nine, rather convex; aperture subovate, one-third of total length. Allied to *M. laqueata*, but more slender and less diameter. *Color*, yellow; within bluish. Length, 0·82; diameter, 0·3. *Kentucky, Tennessee.*

M. nitens. (Id. Ib. p. 182, pl. 6, fig. 40.) Shell folded, shining, somewhat thick: spire obtuse; sutures impressed; whorls seven, somewhat convex; aperture elliptical, angular at base, one-third of total length. *Color*, dark brown; reddish within. Length, 0·76; diameter, 0·3. *Tennessee.*

M. deshayesiana. (Id. Ib. pl. 6, fig. 41.) Shell folded, conoidal, thin: spire rather elevated; sutures impressed; whorls eight, rather convex, striate above; aperture about one-third of total length, elliptical, somewhat angular at base. *Color*, dark horn; within whitish. Length, 0·85; diameter, 0·35. *Tennessee.*

M. concinna. (Id. Ib. p. 183, pl. 6, fig. 42.) Shell folded, transversely striate above, acutely turreted, thin: spire drawn out; sutures impressed; whorls nine, carinate, flattened; aperture about one-fourth of total length, elliptical, angular at base. *Color*, brown; within whitish. Length, 0·75; width, 0·25. *Tennessee.*

M. babylonica. (Id. Ib. pl. 6. fig. 43.) Shell carinate, turreted, rather thick: spire rather elevated, striate at the apex; sutures impressed; whorls seven, angular above; aperture rather large, more than one-third of total length, elliptical. Length, 0·78; diameter, 0·36. *Ohio.*

M. arata. (Id. Ib. pl. 6. fig. 44.) Shell carinated, conical, rather thick: sutures rather deeply grooved; whorls flattened, carinate; aperture small, angular at the base and channelled. *Color*, black; dark within. Length, 0·57; diameter, 0·28. *Tennessee.*

M.? obovata. (Say, Desc. terr. etc. p. 18.) Shell subobvate: whorls nearly 5; spire remarkably rounded, short; body-whorl with a very obtuse slightly indented band a little above the middle; aperture narrow, more than twice the length of the spire; pillar-lip polished, with a callus above; lip not projecting near the base, subrectilinear from the shoulder to the basal curve, very convex at the shoulder; base rounded, and without indentation. *Color*, dark brown or blackish. Length, 0·8. Var. indented; band almost obsolete. Resembles *A. proërosus. Kentucky river.*

M. olivula. (Conrad, Am. Jour. Vol. 25, p. 342, pl. 1, fig. 13.) Shell oblong or elliptical, smooth, entire: spire conical; whorls 5; suture impressed; aperture somewhat elliptical longitudinally. *Color*, olive-green, about half the length of the shell, with strongly marked brown revolving bands; about 4 on the body-whorl. Var. a. with apex eroded, whorl flattened, and spire less conical. *Alabama.*

M. prasinata. (Conrad, Am. Jour. Vol. 25, pl. 1, fig. 14.) Shell subulate, slightly turreted: whorls 7 – 8, flattened; aperture elliptical, a little oblique, about one-third the length of the shell; body-whorl subangulated at the base. *Color:* epidermis olive-green. Var. a. with broad revolving costæ; those on the body-whorl crenulated. *Alabama.*

M. proxima. (Say, Jour. Ac. Sc. Vol. 5, pl. 126.) Shell conic, rather slender, gradually attenuated to the truncated apex: suture moderately impressed; aperture longitudinal; lip with the edge not undulated, or but very slightly and obtusely so near the upper termination. *Color*, black. Height, 0·6. *South-Carolina.*

M. pyrenella. (Conrad, Fr. Wat. Sh. p. 52, pl. 8, fig. 5.) Shell elevated, with flattened whorls having an obsolete spiral line on each: suture impressed; body-whorl angulated, the angle defined by a prominent line; base hardly convex; lip angulated near the centre; aperture patulous; columella obtusely rounded at the base. *North-Alabama.*

M. potosiensis. (Lea, Am. Phil. Tr. Vol. 8, p. 154, pl. 6, fig. 45.) Shell carinate, conoidal, rather thin: spire obtusely elevated; sutures much impressed; whorls 8, convex; aperture large, more than one-third of the total length, ovate. *Color*, brown; within purplish. Length, 0·62; diameter, 0·28. *Missouri.*

M. acuto-carinata. (Id. Ib. pl. 6, fig. 46.) Shell carinate, conoidal, rather thick, shining: spire obtusely elevated; sutures impressed; whorls six; aperture large, nearly one-half of the total length, elliptical, angular at the base. *Color*, dark brown; within purplish. Length, 0·66; diameter, 0·3. *Tennessee.*

M. warderiana. (Id. Ib. p. 185, pl. 6, fig. 47.) Shell carinate, club-shaped, rather thick: spire conical; sutures linear; whorls 8, convex; aperture ovate, rather more than one-third the length of the shell. *Color*, very dark; flesh-colored within. Length, 0·76; diameter, 0·37. *Virginia.*

M. sulcosa. (Id. Ib. pl. 6, fig. 48.) Shell transversely sulcate, conoidal, thick: sutures impressed; whorls flattened; aperture small, ovate. *Color*, yellowish; within whitish. Length, —; diameter, 0·32. *Tennessee.*

M. striatula. (Id. Ib. p. 186, pl. 6, fig. 49.) Shell striate, conoidal, carinate above, rather thin: spire somewhat elevated; sutures impressed; whorls 8, convex; aperture small, rather more than one-third of the total length, elliptical. *Color*, dark reddish brown; reddish within. Length, 0·49; diameter, 0·21. *Tennessee.*

M. pillula. (Id. Ib. pl. 6, fig. 50.) Shell striate, subglobose, thick: sutures somewhat impressed; whorls 4? convex; aperture ovate, about half the length of the shell, angular at the base. *Color*, dark brown; within purplish. Length, 0·43; diameter, 0·34. *Tennessee.*

M. circincta. (Id. Ib. p. 187, pl. 6, fig. 51.) Shell striate above, turreted, rather thin: spire drawn out; sutures small; whorls 9, slightly convex, carinate in the middle; aperture small, elliptical, angular at base. *Color*, pale yellow, with a broad band on the carina; within white. Length, 0·9; diameter, 0·35. *Tennessee.*

M. venusta. (Id. Ib. pl. 6, fig. 52.) Shell subtuberculate above, fusiform, somewhat thin: spire rather obtuse; sutures roughly impressed; whorls 6, convex; aperture elongated at the base, angulated and channelled, rather more than half the length of the shell. *Color*, yellowish above. Length, 0·8; diameter, 0·43. *Tennessee.*

M. florentiana. (Id. Ib. p. 188, fig. 6, fig. 53.) Shell tuberculate, elliptical, ponderous: spire obtuse; sutures impressed; whorls 6, slightly convex; aperture elongated, more than half the total length. Resembles *M. olivula.* *Color*, pale, occasionally with bands; within whitish. Length, 0·87; diameter, 0·47, *Tennessee, Alabama.*

M. salebrosa. (Conrad, l. c. p. 51, pl. 4, fig. 5.) Shell short, suboval, thick, ventricose, with a series of very elevated nodes on the shoulder of body-whorl, and usually two other smaller series beneath: spire very short; aperture contracted, and about half the length of the shell. Columella with a callus above, and another near the base. *Alabama.*

M. semicarinata. (Say, Des. terr. etc. p. 16; Am. Conch. pl. 47. *M. acuta*, Lea, Am. Tr.) Shell small, conic, turrreted, rather slender: spire attenuated, acute, the four apicial whorls carinate below. Whorls 8, somewhat convex; suture moderately impressed; surface, especially of the body-whorl, slightly wrinkled; lip a little prominent near the base. *Color*, tinged with reddish brown within. Length, 0·5. Common. *Kentucky.*

M. simplex. (Say, Ac. Sc. Vol. 5, p. 126.) Shell conic, rather rapidly attenuated to an acute apex: suture not deeply impressed; whorls about 8, but little rounded; aperture longitudinal; lip with the edge not undulated, or but very slightly and obtusely so, near the upper termination. *Color*, blackish; within dull reddish. Height, 0·6; diameter, 0·3. *Virginia.*

M. trilineata. (Say, Des. terr. etc. p. 19.) Shell subglobose, oval: whorls four, rounded; spire short, rather more than half the length of the aperture, which is much dilated, ovate, acute above; base slightly angulated, without any sinus or undulation; lip widely and regularly rounded. *Color*, yellowish; three dark revolving lines on body-whorl, the upper only of which revolves on the spire; the middle band widest: occasionally all obsolete. Length, 0·5. *Ohio river.*

M. trochiformis. (Conrad, op. cit. p. 56, pl. 8, fig. 11.) Shell short, conical, ventricose, turreted: two spiral prominent lines on each whorl, the intervening spaces concave; summits of the whorls flattened, angulated; body-whorl angulated, with the periphery carinate; base flattened; aperture small; lip angulated in the middle. *Alabama.*

M. troostiana. (Lea, Am. Phil. Tr. Vol. 6, pl. 23, fig. 86.)

M. duttoniana. (Lea, Am. Phil. Tr. Vol. 8, p. 188, pl. 6, fig. 54.) Shell tuberculate, fusiform, rather thick: spire elevated, pointed at the apex; sutures irregularly lined; whorls seven, depressed above; aperture elongated, angular and channelled at the base. *Color*, yellow, banded. Length, 1·09; diameter, 0·57. *Tennessee.*

M. holstonia. (Id. Ib. p. 189, pl. 6, fig. 55.) Shell granular, conoidal, somewhat thick: spire somewhat elevated; sutures impressed; whorls flattened above, with four series of small rather sharp elevations round the whorls; aperture ovate. *Color*, black; within purple. Length, 0·79; diameter, 0·38. *Tennessee.*

M. caliginosa. (Id. Ib. pl. 6, fig. 56.) Shell cancellate, conoidal, somewhat thick, transversely striated: spire elevated; sutures irregularly and largely impressed; whorls eight, subconvex; aperture small, about one-third of the total length, elliptical. *Color*, very dark brown; within purplish. Length, 0·91; diameter, 0·34. *Tennessee.*

M. nodulosa. (Id. Ib. p. 190, pl. 6, fig. 57.) Shell cancellate, conoidal, thick: sutures irregularly impressed; whorls subconvex; aperture rather large, elliptical, subangular below. *Color*, dark brown. Length, 0·82; diameter, 0·34. *Tennessee.*

M. boykiniana. (Id. Ib. p. 228, pl. 6, fig. 59.) Shell granulate, elevated, somewhat turreted, at the carina tuberculate: sutures impressed; aperture long, ovate, granulate; revolving lines generally bearing a brown line. Length, 0·94; diameter, 0·38. *Georgia.*

M. catenoides. (Id. Ib. pl. 6, fig. 60.) Shell granulate, elevated, conoidal; apex folded; sutures small; aperture ovate; no tubercles nor carina. *Color:* adult black; young green or yellow. Length, 0·93; diameter, 0·43. *Georgia.*

M. vestita. (Conrad, Fr. Wat. Sh. p. 57, pl. 8, fig. 12.) Shell subulate, subturreted: whorls nine, each angulated below the middle; suture deeply impressed; whorls near the apex acutely carinated. *Color:* epidermis smooth, polished, horn-colored, with a dark band revolving below the angle of each whorl.

GENUS ANCULOTUS. *Say.*

Shell suboval, rarely conical. Spire generally depressed. Aperture suborbicular or obovate, rounded at the base. Base of the columella rounded, or obtusely angulated. Columella wide, thickened, polished, generally with a callus near its superior junction with the labrum.

Obs. This genus was first separated by Say from *Melania*, under the name of *Anculosa* (*Ac. Sc.* 2, 178), which was subsequently changed to *Anculotus*. It includes those which have a shorter spire, and the outer lip more rounded anteriorly. I am not aware that the animals of this genus have been examined.

Anculotus carinatus.

(STATE COLLECTION.)

Description. Shell short, pyramidal, thin, fragile. Whorls with a distinct elevated carina, rather suddenly attenuated to the apex, which is frequently eroded: the whorls are polished, with incremental striæ ascending to the edge of the carina, where they become multiplied, especially on its lower aspect. Suture canaliculate, by the elevated carinæ; aperture subrhomboidal; outer lip simple, angular, reflected at the base; pillar-lip concave, with a broad callus; outer lip above contiguous to the carina of the preceding whorl.

Color. Amber, darker towards the lip.

Length, 0·45; of aperture, 0·25. Extreme width, 0·4.

This very remarkable species, which may probably form the type of a new genus, is from Lake Champlain. My thanks are due to Dr. B. W. Budd, for an opportunity of adding this to the State Collection. I have since obtained others from Cranesport, Broome county, in one of the tributaries of the Susquehannah. These are dark olive-green, and many of them 0·5 – 0·6 long. An eminent conchologist pronounces it identical with *A. dissimilis*, but I have not found the description of this species.

Anculotus trivittatus.

PLATE VII. FIG. 137.

(STATE COLLECTION.)

Description. Shell elliptical: whorls about five, convex; suture impressed; spire short, often eroded, and about the length of the aperture; inner lip arcuated, with a callus; aperture oval, rounded beneath, acute above.

Color. Dark olive, with three dark purple revolving bands on the carina, the central band very narrow.

Length, 0·5; of aperture, 0·25.

These species were obtained from Cranesport, in company with the preceding. In some, the bands are obscure or wanting. It appears to be closely allied to *A. melanoides* of Conrad, but is distinguished by the greater number of its volutions.

(*EXTRA-LIMITAL.*)

A. angulatus. (Conrad, Fr. Wat. Shells, p. 60, pl. 8, fig. 15.) Shells subglobose: body-whorl ventricose, contracted above, biangulated; spire very short; volutions carinated at the suture. *Color*, olivaceous, with about four series of dark quadrangular spots on the body-whorl. *Alabama.*

A. costatus. (Anthony, Bost. Jour. Vol. 3, p. 278, pl. 3, fig. 1. Pl. 7, fig. 139 of this work.) Shell thin, subglobose, with a depressed convex spire: body-whorl ventricose, with about five revolving costæ, varying in number, and occasionally obsolete; whorls four; sutures conspicuous. When the costæ are present, the body-whorl angulated. *Color*, dark olive in the adult; lighter in the young: columella deep purple at the base. Length, 0·2. *Ohio.*

A. dentatus. (Couthouy, Bost. Jour. Vol. 2, p. 185, pl. 4, fig. 7.) Shell rounded or subconical, irregular: whorls 5 – 6, the last large ventricose; spire obtuse, often eroded, with impressed sutures; aperture rounded, effuse at base. Columella arcuated, with a toothlike process near the base. *Color*, olive to blackish green, occasionally with 2 – 3 dark brown transverse bands: columella dark brown or purple. Length, 0·25. Allied to *monodontoides. Rapids of Potomac, Virginia.*

A. melanoides. (Conrad, Fr. Wat. pl. 8, fig. 19.) Shell conical, with three volutions: apex eroded; whorls flattened, only rounded at the sutures; lines of growth prominent; body-whorl abruptly rounded; aperture elliptical, about half the length of the shell. *Color*: epidermis blackish, obscurely banded. Length, 0·5. An *Melania? Alabama.*

A. monodontoides. (Id. Ib. pl. 8, fig. 16.) Subglobose: body-whorl ventricose, not abruptly rounded above; apex eroded; columella with a large pyramidal tooth at the base; aperture effuse. *Color*, horn, with obscure bands. Mr. Couthouy (*Bost. Jour.* Vol. 2, p. 186) states that the tooth resembles a plait, and is on the middle, and not near the base. *Virginia.*

A. nigrescens. (Id. Id. pl. 8, fig. 17.) Subconical, truncated at tip: upper whorl hardly convex; body-whorl elongate, contracted above on the labrum; columella flattened, obtusely rounded at the base; aperture obovate, rather more than half the length of the shell. *Color:* epidermis blackish; within dark purple. *Maryland.*

A. plicatus. (Id. Ib. pl. 8, fig. 18.) Suboval with a short spire, of which one whorl only is entire, rounded: body-whorl slightly ventricose, with oblique plaits, which are crenulated on the margins of a slight spiral groove near the suture; aperture elliptical. *Color*, greenish or blackish, with spiral bands. *Alabama.*

A. pictus. (Id. Ib. pl. 62. Am. Jour. Vol. 25, p. 342, pl. 1, fig. 15.) Suboval; shoulder obtusely rounded; aperture obovate, large; columella callous above. *Color*, olive, with numerous quadrangular small spots disposed in revolving lines, strongly marking the aperture. Length, 0·5; diameter, 0·35. *Alabama River.*

A. proerosus. (Say, Ac. Sc. Vol. 2, p. 177. Conrad, l. c. pl. 8, fig. 13.) Subglobose, oval: whorls 3 – 4, wrinkled across; spire very short, much eroded, sometimes scarcely prominent above the body-whorl, which is large, ventricose, with a very obtuse revolving band; aperture suboval, above acute, effuse; base of the columella elongated and incurved, meeting the exterior lip at an angle. *Color*, brownish; a few revolving purplish dots within, sometimes obsolete. Length, 0·8. *Ohio.*

A. pumilus. (Conrad, Op. cit. p. 62.) Very small, obliquely oval: spire consisting of one entire convex whorl; apex eroded; body-whorl regularly convex; base with a groove behind the columella; aperture patulous, suborbicular. *Color*, blackish. *Alabama.*

A. subglobosus. (Say, Ac. Sc. Vol. 5, 128. Conrad, pl. 8, fig. 14.) Subglobose: spire but little elevated, not half the length of the aperture; whorls about four; aperture rounded, nearly as broad as long; pillar-lip somewhat flattened. *Color*, brownish horn; aperture more or less tinged with red. Length, 0·6; diameter, 0·5. *Virginia.*

A. tæniatus. (Id. loc. cit. p. 63.) Shell oval or oblong: one whorl of the spire not eroded, often longitudinally produced. *Color*, olivaceous, with dark green spiral bands: four on the body-whorl. Length, 0·7. *Alabama.*

Genus Io, *Lea.* Shell fusiform; base canaliculate; spire elevated; columella smooth and concave.

Io fusiformis. (Lea, Trans. Am. Phil. Soc. Vol. 4, p. 122, pl. 15, fig. 37. a. b. *Fusus fluviatilis*, Say, Jour. Acad. Nat. Sciences, Vol. 5, p. 129.) Shell fusiform: spire much elevated, gradually tapering; volutions nearly six, wrinkled across, and with a series of elevated undulations on the middle; suture merely an impressed line; aperture somewhat fusiform; lip within the edge, undulated; canal rounded at tip; columella very concave. *Color*, olive green or brownish, with more or less dull reddish lines of the same, confluent. Length, 1·8; diameter, 0·9. *Salt streams in the interior of Virginia.*

GENUS LITTORINA. *Ferussac.*

Animal with slender elongated tentacles. Mouth only with a lingual band. Foot oblong, with a marginal furrow in front. Organs of generation in both sexes on the right side, at the entrance to the branchial cavity, quite near the vent. Marine. *Shell*, thick, globular, conic or subturreted; no umbilicus. Spire of a few rounded whorls. Aperture rounded, large, entire; outer lip sharp, not continuous behind. Opercle horny, spiral.

LITTORINA RUDIS.

PLATE V. FIG. 103.

(STATE COLLECTION.)

Turbo rudis. MONTAGU, Test. Brit. MATON and RACKETT, Lin. Trans. Vol. 8, p. 150, pl. 4, figs. 12, 13.
T. obligatus. SAY, Jour. Acad. Nat. Sciences, Vol. 2, p. 241. RUSSEL, Ess. Jour. Vol. 1, p. 72.
Littorina rudis. GOULD, Invertebrata of Mass. p. 257, fig. 165.

Description. Shell very strong and coarse, subovate, ventricose. Whorls five to six, convex, tapering rapidly to a little elevated spire, and covered with revolving elevated lines and grooves. Body-whorl with 10 – 12 revolving costæ, the intervening spaces finely reticulated; lip plaited by the termination of the costæ; about four of these on the next whorl, and obsolete above; base of the lip broadly bevelled; pillar-margin also broadly flattened. Aperture regularly oval.

Color. Obscurely brownish: "sometimes orange or olive, occasionally banded with white" (GOULD).

Length, 0·5; of aperture, 0·3.

A very common little shell on the shores of Long island. From the description alone, I should have considered this as distinct from the *rudis*, which, according to Maton and Rackett, have the "anfractus interdum leviter striati;" whereas all of ours are invariably strongly costate. It agrees, however, entirely with a specimen from the North Sea, in Dr. Jay's Cabinet, obtained from the collection of M. Bosc, and labelled "*T. rudis*, Montagu."

Littorina tenebrosa.

PLATE VI. FIG 106.

(STATE COLLECTION.)

Turbo tenebrosus. Montagu, Test. Brit.
T. vestitus. Say, Jour. Acad. Nat. Sc. Russel, Essex Journ. Vol. 1, p. 72.
Littorina tenebrosa. Gould, Invertebrata of Mass. p. 259, fig. 166.

Description. Shell small, conic, not as stout as the preceding. Spire elevated and pointed, as long as the aperture. Whorls five to six, rounded, with faint revolving lines. Suture deeply impressed: lip thin, acute.

Color, variable: according to Mr. Say, usually invested with a soiled greenish white pigment, beneath which it is sometimes reticulated with abbreviate yellow lines on a brown or dusky ground. *Animal* with a dark olive head, and an olive stripe on the tentacles from the eye: sides of the foot lined with the same.

Length, 0·5. Diameter, 0·3.

Scarcely any species varies more in its external markings, and the specimen figured is only one of numerous varieties. They are brown, immaculate, black, green, sometimes reddish, with pale revolving lines, and occasionally as represented in the figure. Mr. Sowerby, after a careful comparison of specimens, believes that *vestitus* and *obligatus* are both identical with the *tenebrosa* of Montagu. I coincide with Dr. Gould in referring only to this latter species, the *vestitus* of Say.

Littorina neritoides.

PLATE VI. FIG. 109. A. B. Young; FIG. 110. A. B. Adult. — PLATE VI. FIG. 111. A. B. Adult. *T. neritoides* of Europe.

T. neritoides. Linn. Syst. Nat. 1232.
Littorina palliata. Gould, Invertebrata of Mass. p. 260 (excl. syn.).

Description. Shell small, very thick, smooth in the adult; with minute revolving and vertical lines in the young. Whorls four; the spire is flattened, and (except in very young shells) scarcely rises above the body. Suture moderately distinct in the young, but very faintly marked in the adult. Aperture nearly circular, or slightly oval; the lip acute, entire, bevelled on its inner margin, which is continuous with the curve of the pillar-lip in the adult. Opercle corneous, smooth, subspiral.

Color, variable, usually uniform sulphur-yellow, as represented in figs. 109 and 110; the young being of a dark amber brown: often whitish, greenish or orange, and occasionally striped. "*Animal:* head orange, darker above; the foot drab or cream-color" (Gould).

Length, 0·4 – 0·6. Diameter of adult, 0·7.

This is very common along the coast, and has usually been referred to the *T. neritoides* of Europe, an adult specimen of which is now before me (See fig. 111). The surface is minutely reticulated; spire flat; outer lip broadly bevelled at base, slightly so on the remaining part; lip thin, turned forward above, and forming an acute angle with the body-whorl; (in the American specimens, however, the lip is bevelled throughout;) the aperture is obliquely oval, instead of being nearly circular as in *palliata*. The color, in compared specimens, is identical. A few other slight differences will suggest themselves by a comparison of the figures.

Littorina irrorata.

PLATE VI. FIG. 112. A. B.

Turbo irroratus. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 239.

Description. Shell solid, robust, pyramidal, with numerous elevated obtuse equal lines: suture not indented; spire acute; pillar-lip thickened; lip stout, bevelled to a moderately thin edge, which is everted below; directly straight above; aperture oval, angulated above.

Color. Pale ash or cinereous, or deep brown; pillar-lip umber-brown; lip on its margin with purple abbreviated lines.

Length, 0·8 – 1·0; of aperture, 0·4 – 0·5.

Common in salt meadows. I have seen them at Harlem, in great numbers, clinging to the stems of salt grass. Some exceed the dimensions just given.

Littorina palliata.

PLATE VI. FIG. 105. A. B. C.

(STATE COLLECTION.)

Turbo palliatus. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 240.

Description. Shell moderately stout, suboval. Whorls four to five, convex, with transverse sinuous wrinkles: spire short, convex, obtuse, but little elevated, much shorter than the aperture; suture moderately indented; aperture circular, slightly angulated above, patulous; lip acute, with large incremental lines.

Color. Frequently endued with a greenish or reddish brown or blackish pigment, concealing the reticulated surface; within dark purplish or dusky brown; margin of the aperture whitish.

Length, 0·45; of aperture, 0·3.

Common on our seashores, and quite distinct, as I conceive, from *L. littorina:* the lip is not so broadly bevelled, and is more patulous, and the surface is reticulated at all ages.

GENUS MARGARITA. *Leach.*

Shell conical, moderately elevated. Whorls few, subinflated; aperture rounded, imperfect posteriorly; lip sharp; umbilicus deep. Opercle multispiral; the nucleus central.

Obs. This genus, instituted by Dr. Leach, includes a number of small marine shells hitherto included under the genus *Turbo*.

Margarita ornata.

PLATE VI. FIG. 104.

(STATE COLLECTION.)

Description. Shell moderately solid, subconical; its transverse exceeding its vertical diameter. Whorls four to five, convex; the body-whorl very large, subinflated. Seven to nine distant revolving costæ on its upper surface, which is separated from the simply striate surface beneath by an obsolete carina. Spire scarcely much elevated, faintly striated; umbilicus large and very profound; aperture rounded, oblique; lip thin and simple, entire.

Color. Bright red.

Length, 0·1. Width, 0·15.

I have met with many specimens of this beautiful shell, collected on the shores in the neighborhood of New-York. It is somewhat allied to *M. undulata,* but is much larger, and the costæ subequal.

Margarita undulata.

Margarita undulata. Sowerby, Malac. and Conch. Mag. 1, p. 26.
Turbo incarnatus. Couthouy, Bost. Journ. Nat. Hist. Vol. 2, p. 98, pl. 3, fig. 13.
M. undulata. Gould, Invertebrata of Mass. p. 254, fig. 162.

Description. Shell orbicular, small, smooth and shining. Whorls four to five, convex, impressed with numerous striæ alternating with others still finer, undulated near the sutures by short folds or wrinkles: sutures distinct; basal striæ much finer than those above; umbilicus large, extending quite to the apex, and partially covered by the reflected inner lip; aperture nearly circular, very oblique. Opercle thin, horny, multispiral.

Color. Uniform red, of various shades.

Length, 0·3. Width, 0·4.

This boreal shell was discovered nearly simultaneously by Messrs. Couthouy and Sowerby, the latter having the priority of publication. It has been found in the stomachs of fishes, and along the seacoast of Massachusetts. It will probably be detected on our own coast.

Margarita arctica.

PLATE VI. FIG. 107.

(STATE COLLECTION.)

Margarita arctica. Leach, Ross's Voyage 1819, appendix.
Turbo inflatus. Totten, Am. Jour. Sc. Vol. 28, p. 368, fig. 5.
T. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 73.
M. arctica. Gould, Invertebrata of Mass. p. 255, fig. 163.

Description. Shell small, thin, translucent, shining and globular. Whorls five, convex, obsoletely and transversely striate, and with revolving minute lines on the base: spire low, convex, and shorter than the aperture; suture impressed; aperture large, circular and expanded; lip simple, sharp, and somewhat reflected at the umbilicus, which is large and deep. Opercle horny, multispiral.

Color. Pale brownish yellow or horn-color, immaculate, of a somewhat pearly lustre, and feebly iridescent.

Length, 0·2. Width, 0·25.

This has not been observed as yet nearer to our shores than the coast of Massachusetts.

Margarita cinerea.

PLATE VI. FIG. 113.

(STATE COLLECTION.)

Turbo cinereus. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 99, pl. 3, fig. 9.
M. cinerea. Gould, Invertebrata of Mass. p. 252.

Description. Shell small, thin, pyramidal. Whorls five to seven, and rendered angular by four to six revolving elevated ribs, diminishing in number as they approach the apex: central rib largest; surface with minute oblique striæ, not interrupted by the ribs, and giving a somewhat nodulous appearance; umbilicus broad and deep; lip sharp; aperture circular, slightly angulated at the junction of the outer lip, which is crenulated by the termination of the striæ, and slightly reflected over the umbilicus. Opercle horny, transparent, multispiral.

Color. Uniform ashen, slightly tinged with green.

Length, 0·5. Width, 0·4.

From the stomachs of fishes on the coast of Massachusetts, and on the coast of Maine.

MARGARITA MULTILINEATA.

PLATE VI. FIG. 108.

(STATE COLLECTION.)

Description. Shell small, pyramidal. Whorls four, convex, obtusely carinate: suture impressed; spire elevated; whorls with minute revolving striæ, and three to four revolving ribs; aperture suborbicular; umbilicus entirely concealed by the reflection of the lip, but its place marked by a slight depression.

Color. Beautifully variegated by alternate yellowish white and brown or reddish brown revolving lines; lip with abbreviated red and white lines.

Length, 0·3; of aperture, 0·13.

I am indebted to my excellent friend, Mr. Couthouy, for the specimens here described, and which he considered to be new. He obtained them from the stomachs of codfishes on the coast.

(*EXTRA-LIMITAL.*)

M. obscura, COUTHOUY. (GOULD, Op. cit. fig. 161.) Depressed conical, solid; spire obscure, reddish brown, base ash-colored; whorls angulated by two or three revolving ridges; lines of growth coarse; aperture circular; pearly within. Length, 0·2; diameter, 0·3. Stomachs of fishes. *Massachusetts.*

M. argentata. (GOULD, Op. cit. p. 256, fig. 164.) Shell very minute, depressed-conical, covered with microscopic revolving lines; umbilicus moderately large. *Color*, pearly white; iridescent within. Length, 0·1. Stomachs of fishes. *Massachusetts.*

GENUS CINGULA. *Fleming.*

Shell small, thin, elongated, of several whorls. Aperture small, entire ; the lips continuous posteriorly. Opercle horny, subspiral.

Cingula minuta.

PLATE VI. FIG. 117.

(STATE COLLECTION.)

Turbo minutus. Totten, Am. Jour. of Sci. Vol. 26, p. 369, pl. fig. 6, a. b.
T. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 73.
T. id. Gould, Invertebrata of Mass, p. 265, fig. 171.

Description. Shell minute, conic, thin, polished, elevated to an obtuse apex. Whorls five, convex, with very fine transverse striæ. Suture distinct, with a rounded shoulder on the whorl. Aperture oval, entire, rounded at the base, very slightly angular above : lip sharp ; lower portion of the pillar-lip slightly recurved, with a loosely attached enamel, which rises before an umbilical pit. Opercle horny, subspiral.

Color. Yellowish brown, usually coated with a dark green pigment. Animal dusky brown : tentacle, and a line on each side of the neck, light drab.

Length, 0·1 – 0·15. Width, 0·05.

This minute species was first detected by Col. Totten of the U. S. Engineers, at Rhode-Island. Along the coast of Massachusetts, it occurs on seaweed and other marine plants.

Cingula aculeus.

PLATE VI. FIG. 115.

(STATE COLLECTION.)

Cingula aculeus. Gould, Invertebrata of Mass. p. 266, fig. 172.

Description. Shell minute, subcylindrical, elongated, fragile. Whorls six, very convex, with a deep suture. Surface with numerous revolving equidistant microscopic lines, with traces of vertical folds on the upper whorls. Aperture suboval, oblique, one-fourth the length of the shell : margin entire, and slightly turned over the umbilicus ; the revolving lines seen through the interior of the outer lip. Opercle horny.

Color. Epidermis thick, and of a light yellow straw-color ; beneath horn-color.

Length, 0·2 ; of aperture, 0·05.

This was sent to me several years ago, from the northern coast, by Mr. Couthouy, as an undescribed *Pyramis?* I then referred it to *Turbo,* under an appropriate subgenus. Since that period, Dr. Gould has arranged it in its present place. It will probably be found in our waters.

Cingula lævis.

PLATE VI. FIG. 118.

(STATE COLLECTION.)

Description. Shell small, moderately solid, elevated. Whorls five, very convex, and separated by a deep suture; the two upper whorls rather rapidly diminishing in size. Surface smooth, but (under the lens) exhibits faint traces of incremental lines; the two lower whorls more than half the total length. Body-whorl large; aperture small, nearly regularly oval, slightly angulated above; pillar-lip arcuated, elevated, and partially everted over the distinct and rather large umbilicus.

Color. Opake white in the adult; transparent corneous in the young, with occasionally the upper whorls deep black.

Length, 0·2; of aperture, 0·08.

I received numerous specimens of this shell from the Rev. Mr. Linsley of Stratford (Conn.), who obtained them from the crop of a wild duck. I then referred it to *Odostomia*, and gave a specific name which recalled the form of a *Limnea*. I was subsequently furnished with specimens by Dr. Charles Stillman, who obtained them at Bushwick inlet, near the city, where they had been washed upon the shore after a storm. The above dimensions are given from one of the largest size. In its general form it resembles *C. aculeus*, with which indeed it may, perhaps, be identified. It differs from *C. minuta* by its constantly greater size, the smallness and more inferior position of the aperture, the wide umbilicus, and deeper suture.

GENUS LACUNA. *Turton.*

Shell globose or conical, thin; covered with a smooth epidermis. Spire short, consisting of a few rapidly enlarging whorls. Aperture semilunar, rounded at the extremities. Columella oblique, reflected over part of the umbilicus, which forms a lengthened groove.

Lacuna vincta.

PLATE VI. FIG. 119. a. b. c.

(STATE COLLECTION.)

Turbo vinctus. Montagu, Test. Brit. 307, pl. 20, fig. 3.
Lacuna pertusa. Conrad, Jour. Acad. Nat. Sciences, Vol. 6, p. 266, pl. 11, fig. 19.
Lacuna vincta. Gould, Invertebrata of Mass. p. 262, fig. 178.

Description. Shell small, thin, ovate-conic: spire pointed; whorls five, very convex, with faint incremental lines; suture deep; aperture nearly circular; lip sharp and simple; pillar-

lip with a wide and deep groove behind, ending in a profound umbilicus. Opercle horny, subspiral.

Color. Uniform yellowish horn, under which condition it has been termed *L. fusca.* Frequently yellowish or soiled white, with four or five dark purplish or reddish bands.

Length, 0·3.

This small shell, which has also been named *T. quadrifasciatus,* occurs on the shores of Long island sound. I am indebted to Mr. Linsley of Stratford, for numerous specimens.

(*EXTRA-LIMITAL.*)

L. neritoidea. (Gould, Op. cit. fig. 170.) Shell globular-ovate, with three and a half whorls, the last very large, smooth, yellowish green: aperture semilunar, oblique; umbilicus large and deep. Length, 0·2. *Massachusetts.*

GENUS TURRITELLA. *Lamarck.*

Animal with a proboscis, and a fringe above it like a veil. Tentacles long, filamentous, with the eyes on the outer base on a tubercle. *Shell,* turreted, pointed, elongated, slender, spirally striated: aperture rounded, entire; lip disjoined above, the outer lip thin. Opercle horny.

Turritella interrupta.

PLATE VI. FIG. 123.

Turritella interrupta. Totten, Am. Jour. of Sci. Vol. 28, p. 352, pl. fig. 7.
T. id. Adams, Bost. Jour. Nat. Hist. Vol. 2, p. 275.
T. (Eulima?) id. Gould, Invertebrata of Mass. p. 268, fig. 173.

Description. Shell small and slender. Whorls about ten, almost flat, on which are from twenty to thirty transverse obtuse ribs, crossed by about fourteen subequal revolving lines interrupted by the ribs; these are arranged in pairs, so closely applied as often to be confounded in one: below the middle of the body-whorl, the ribs become obsolete, and the revolving lines are uninterrupted: a slight shoulder on each whorl, causes the sutures to be quite distinct. Aperture ovate, sharply angular above; inner lip slightly everted.

Color. Whitish brown and amber-colored.

Length, 0·2 – 0·3. Width, 0·08.

This species was discovered and named originally by Col. Totten of the U. S. Engineers, who dredged it from the coast of Rhode-Island. It was subsequently found on the coast of Massachusetts. My friend Dr. Budd obtained it by dredging in the East river, in mud, opposite Newtown creek, and in five fathom water off the Quarantine ground.

Turritella erosa.

PLATE VI. FIG. 122.

(STATE COLLECTION.)

Turritella erosa. Couthouy, Bost. Jour. Vol. 2, p. 103, pl. 3, fig. 1.
T. *id.* Gould, Invertebrata of Mass. p. 267.

Description. Shell larger than the preceding, turreted, elongate. Whorls nine to eleven, rather flat, smooth, sloping towards the suture: from three to five abruptly revolving grooves, most prominent and numerous on the lower whorls. Striæ of growth wrinkling the shell longitudinally. Apex often eroded: aperture circular; lip thin, and impressed by the termination of the costæ. Columella with a slight callus and angular base.

Color. Reddish brown; epidermis sometimes dark lilac.

Length, 0·5 – 0·8; of aperture, 0·15.

Found in the stomachs of fishes, on the seacoast of Massachusetts.

(*EXTRA-LIMITAL.*)

T. impressa. (Say, Acad. Sc. Vol. 2, p. 244.) Shell with an acute apex: whorls six, with about four acute impressed revolving lines; lip not thickened, a slight indentation at its base, and a projection within on the middle. *Color*, dusky. Length, 0·1. *Seacoast.*

T. æqualis. (Say, Jour. Ac. Sc. Vol. 5, p. 208.) Shell subulate. Whorls ten, each with about twenty-two transverse elevated obtuse equal lines, with interstitial grooves of the same diameter: suture impressed, distinct; aperture rounded at the base, and destitute of any distinct emargination. *Color*, white. Length, 0.2. *Seacoast.*

T. alternata. (Say, Ac. Sc. Vol. 2. p. 243.) Shell acute at apex. Whorls eight, with about eight unequal revolving slightly elevated lines, maculated with rufous, and decussated by transverse elevated obtuse lines, obsolete below the middle of the body-whorl, and prominent on the spire. Lip not thickened; a slight indentation at the base. *Color*, whitish ash. Animal with long white tentacles, annulate with brown. Length, 0·2. *Seacoast.*

T. concava. (Say, Ac. Sc. Vol. 5, p. 207.) Shell subulate. Whorls more than ten, concave in the middle, and sculptured with 2 – 4 obsolete impressed revolving lines, and with an apicial and basal band of about fifteen longitudinal undulations on each whorl; the basal band passes round the middle of the body whorl. Suture very slightly impressed: canal rather prominent. *South-Carolina.*

GENUS PYRAMIS. *Brown.*

Shell small, elongated, of numerous whorls. Aperture short, ovate, entire in front; lip sharp, disunited above; pillar without a fold

Pyramis striatula.

PLATE VIII. FIG. 169.

Pyramis striatula. Couthouy, Bost. Journ. Nat. Sciences, Vol. 2, p. 101, pl. 1, fig. 6.
P. id. Gould, Invertebrata of Mass. p. 269, fig. 174.

Description. Shell small, smooth, subulate, imperforate, usually polished. Whorls seven to nine, nearly flat, marked by twelve to fifteen minute regular revolving striæ, diminishing in number to the apex: suture linear, and rather deeply impressed. Aperture ovate-acute, angular above; base very slightly effuse: outer lip sharp, smooth, without any sinus or groove at its junction with the body-whorl; pillar-lip arched regularly throughout.

Color. Pale bluish white; within milk-white.

Length, 0·6. Basal diameter, 0·2.

Stomachs of fishes, off the coast of Massachusetts.

GENUS ODOSTOMIA. *Fleming.*

Shell conical, elongated; aperture ovate; lips disunited above, and sometimes produced beneath. Pillar with a tooth-like fold. Opercle horny, subspiral.

Odostomia trifida.

PLATE VIII. FIG. 170.

(STATE COLLECTION.)

Actæon trifidus. Totten, American Journal of Science, Vol. 26, p. 368.
Odostomia trifida. Gould, Invertebrata of Mass. p. 274, fig. 179.

Description. Shell small, elevated, pointed, smooth and glossy. Whorls eight, flat, with about six impressed revolving lines; the one above, and the two next below the suture, wider and more distinct: ten or twelve very minute lines at the base of the body-whorl. Spire gradually tapering to an acute apex. Aperture elongate, about one-third the length of the shell, acutely angular above, produced and rounded below. Outer lip sharp and thin, entire; pillar-lip with a single sharp oblique fold: opercle horny.

Color. Ivory and soiled white.

Length, 0·2. Width, 0·08.

This small species was originally detected by Col. Totten, in the waters of Rhode-Island. I have obtained them from Mr. Charles Wheatly, who dredged them from the mud in five fathom water, opposite Staten island, and subsequently obtained them along the shore. They are not uncommon on the northern shores of Long island. I have received specimens of an *Odostomia ?* from Mr. Couthouy, which differs from the above in having more than one fold on the columella. It will be described by Mr. Couthouy.

Odostomia seminuda.

PLATE VIII. FIG. 171.

(STATE COLLECTION.)

Jaminia seminuda. Adams, Bost. Jour. Nat. Hist. Vol. 2, p. 280, pl. 4, fig. 13.
Odostomia seminuda. Gould, Invertebrata of Mass. p. 273, fig. 178.

Description. Shell small, acute, conic. Whorls seven, convex: upper whorls and half of the body-whorl longitudinally rugose, crossed by three equidistant revolving lines, presenting a granulated appearance: at the base of the lower whorl are four revolving lines, beginning on the middle, where the folds abruptly terminate. Suture distinct, divided by an indistinct spiral ridge. Aperture oval; the outer lip very thin, and scolloped by the revolving lines; the pillar-lip with an inconspicuous fold.

Color. Glossy white, translucent.

Length, 0·15. Width, 0·07.

First observed by Prof. Adams on the coast of Massachusetts, and since dredged by Dr. Stillman in the East river opposite Newtown creek. These latter specimens are larger than those described by Messrs. Adams or Gould, having a total length of 0·25, and width of 0·1.

Odostomia insculpta.

PLATE XXXI. FIG. 297.

(STATE COLLECTION.)

Description. Shell elevated, thick, opaque, regularly tapering to the apex. Whorls seven, flat, with a deeply impressed suture: body-whorl with ten deeply sculptured closely approximated revolving striæ on the lower half, and five distant revolving lines on the upper half; about four on the next whorl, and gradually diminishing in number above. Aperture ovate, acute above, effuse beneath. Lip simple; fold on the pillar-lip near the middle, distinct under the lens, and deepening within.

Color. Soiled white; the sculptured lines rufous.

Length, 0·2; of aperture, 0·08.

This species, apparently belonging to the *Monotigma* of Gray, was obtained by Dr. C. Stillman on the shore of the East river, near the city, after a storm. It resembles exceedingly the *Pyramis striatula* of Couthouy; but it differs specifically by its deeply sculptured furrows, and its tooth-like fold, from the genus.

Odostomia fusca.

PLATE XXXVI. FIG. 342.

(STATE COLLECTION.)

Pyramis fusca. Adams, Bost. Journal Nat. Hist. Vol. 2, p. 282, pl. 4, fig. 9.
Jaminia id Id. Ib. Vol. 3, p. 337.
Odostomia id. Gould, Invertebrata of Mass. p. 270, fig. 176.

Description. Shell small, subelongate, conical. Spire truncate obtuse; whorls six, convex; suture strongly impressed, and with a revolving line below it, causing it to appear double. Aperture broadly ovate, acutely angular above, dilated in the middle. Fold on the pillar-lip far within, occasionally double, and in some cases obsolete; an umbilical indentation about the middle of the left lip.

Color. Epidermis shining brown.

Length, 0·15 – 0·25.

Specimens of this shell have been presented by Dr. Stillman, who obtained them by dredging in the East river opposite Newtown creek. They were originally found on the coast of Massachusetts.

(*EXTRA-LIMITAL.*)

O. producta. (Jaminia *id.* Adams, Bost. Jour. Vol. 3, p. 322, pl. 3, fig. 8. Pl. 31, fig. 296 of this book.) Shell conic-cylindrical: whorls eight, nearly flat; columella flexuous. Allied to *O. fusca*, but more slender. *Color*, dusky horn. Length, 0·25. *Coast of Massachusetts.*

O? exigua. (Jaminia *id.* Couthouy, Loc. cit. Vol. 2, p. 92, pl. 2, fig. 7. *T. bisuturalis*, Say, Ac. Sc. Vol. 2, p. 244. Pl. 31, fig. 294, 295, var.) Shell minute, ovate, conical, smooth, with a single revolving line below the suture: aperture oval, subumbilicated. *Color*, light green; epidermis brownish. Length, 0·15; width, 0·05. On decaying wood near the shore. *Massachusetts.*

A variety of this species (fig. 295), with more rounded volutions, and a very faint trace of umbilicus, is occasionally found on our coast.

Genus Vermetus. *Animal* vermiform: head not very distinct, and furnished with a proboscis, provided at its extremity with many series of hooks; two conic and slightly flattened tentacles with the eyes at their external base; foot cylindrical, with two long filaments in front. *Shell* conic, tubular, spiral at the apex, irregularly and loosely twisted towards the aperture, which is sharp and continuous: opercle horny.

V. lumbricalis? LIN. (Pl. 36, fig. 349 of this book.) Tubular: usually many interlaced together with numerous raised lines along its length; spire with 8 – 10 closely connected whorls. *Color,* ashen gray. Length, 8 – 10 inches.

The *lumbricalis* is reddish brown, and not more than four inches long. *Northern Coast.*

GENUS SKENEA. *Fleming.*

Shell minute, discoidal, concavely umbilicated beneath. Whorls three; mouth expanded.

SKENEA SERPULOIDES.

PLATE XXXII. FIG. 203.

Delphinula serpuloides. ADAMS, Bost. Jour. Vol. 3, p. 334.
Skenea id. GOULD, Invertebrata of Mass. p. 247, fig. 189.

Description. Shell very minute, diaphanous, smooth, not shining, slightly convex above and broadly concave beneath, forming a deep umbilicus which exhibits all the whorls. Whorls three: suture broad and deep. Aperture entire, free, turning downwards, circular, in contact with but not embracing any part of the preceding whorl: lip sharp, and receding so as to form an acute gape as it joins the preceding whorl. Opercle horny, multispiral; the apex central.

Color. Reddish brown or horn-color.

Length, 0·03. Width, 0·07.

One of the smallest of our marine shells, usually attached to stones about low-water mark. Common on the northern coast, and will probably be found on the shores of this State.

(*EXTRA-LIMITAL.*)

S.? laxa. (DELPHINULA *id.* SAY, Jour. Ac. Sc. Vol. 5, p. 207; Am. Conchology, pl. 7.) Shell regularly spiral, subovate, nearly smooth. Whorls rounded, perfectly disjoined throughout, rapidly lessening to the apex: a dilated groove on the line of the umbilicus; aperture oval, with a sharp edge. *Color,* whitish tinged with yellow. *South-Carolina.*

An var. monst. *Naticæ* vel *Valvatæ?*

GENUS VALVATA. *Muller.*

Animal with a distinct head, elongated with a proboscis. Tentacles very long, approximate, cylindrical, obtuse: eyes sessile, behind their bases. Foot bilobed in front. Gills long, pectiniform, more or less exsertile. Cavity widely patulous, and furnished on the right of its lower margin with a long appendix resembling a third tentacle. The male organ retractile into the breathing cavity. Inhabiting fresh water. *Shell* discoid or conoid: whorls cylindrical, loosely cohering; aperture circular, its margin sharp, entire; opercle circular, horny.

VALVATA TRICARINATA.

PLATE VI. FIG. 130. A. B.

(STATE COLLECTION.)

Cyclostoma tricarinata.		SAY, Nich. Ency. Acad. Nat. Sc. Vol. 1, p. 15.
Valvata	*id.*	ADAMS, American Journal of Science, Vol. 40, p. 267.
V.	*id.*	GOULD, Invertebrata of Mass. p. 225, fig. 156.

Description. Shell small, thin, depressed. Whorls three, flattened at the summit; the body-whorl with three revolving keels, the others with but two. Suture deeply impressed; aperture circular, oblique, modified by the keels; umbilicus large, patulous, and exhibiting all the volutions to the summit.

Color. Brownish white, often pearly, occasionally greenish.

Height, 0·1. Diameter, 0·07.

Found in many streams and ponds throughout the State.

VALVATA UNICARINATA.

PLATE VI. FIG. 129.

(STATE COLLECTION.)

Description. Shell small; apex depressed. Whorls three or four, impressed with minute incremental striæ, all flattened above, and bounded by a revolving rib or keel, which in the younger individuals ascends to the summit. Aperture circular, nearly vertical, scarcely modified by the keel. Opercle corneous, thin, with concentric striæ: umbilicus wide, profound, exhibiting all the volutions.

Color. Milky bluish white; apex often tinged with rufous.

Height, 0·1. Diameter, 0·15.

These dimensions are from one of the largest size, obtained from Lake Champlain, where they are very abundant, and from the Erie canal. It is allied to the preceding, and forms

the passage to *sincera*. Some eminent conchologists suppose this, and perhaps the following, to be but mere varieties of *tricarinata*. It approaches the *V. humeralis* of Say, from Mexico; but it is smaller, not so much depressed, and has a wider umbilicus.

Valvata sincera.

PLATE VI. FIG. 127. A. B. — PLATE VI. FIG. 128. Monstrous variety.

(STATE COLLECTION.)

Valvata sincera. Say, Long's Exped. St. Peters, Vol. 2, p. 264, pl. 15, fig. 11.
V. id. Adams, American Journ. Sciences, Vol. 40, p. 267.

Description. Shell small, subglobose, conic. Whorls nearly four, accurately rounded, finely and regularly wrinkled across. Aperture not interrupted by the penultimate whorl, nor appressed to it, but merely in contact; the lip not diminished in thickness at the point of contact. Umbilicus large, exhibiting all the volutions.

Color. Light, often whitish; the apex frequently purplish.

Height, 0·1. Diameter, 0·2 nearly.

Var. A. The transverse wrinkles obsolete.

I have received specimens from various parts of the State, and am chiefly indebted to Drs. Boyd and Emmons, and to Dr. Jay, for specimens. They are abundant in Lakes Champlain, Chautauque, Oneida, &c. I have seen a monstrous variety of this species from the collection of Dr. Newcomb (fig. 128), which presents the following characters:

Shell oblong, subcylindrical. Whorls three or four, rounded, smooth: apex depressed; first whorl horizontal, the following whorls entirely detached; aperture oblique, oval, slightly angular, and effuse at its point of contact with the body-whorl. Umbilicus small, partially covered by the effuse lip. *Color*, light waxen. Height, 0·13; diameter, 1·95.

In this great deviation from the normal form, it is not unlike the monstrous variety of *Helix*, described and figured by Ferussac (*Hist. Moll. terr. etc.* pl. 36, fig. 12). In the cabinet of Dr. Jay, there is a monstrous variety of *Carocolla albolabris*, in which the whorls are separated and the lip effuse. The specimen under consideration comes from the Mohawk river.

There is frequently found associated with this and the preceding species, an agglutinated arenaceous mass, resembling them very much in form. This has been described as *V. arenifera*, in the *Transactions of the American Philosophical Society* (Vol. 4, p. 104, pl. 15, fig. 36. A. B.), and has since been erected by Mr. Swainson into the new genus *Thelidomus* (See Lardner's *Cabinet Cyclopedia*, No. 123, pp. 226, 353). It is believed to be the case of the larva of some aquatic insect, possibly a *Phryanea*.

(*EXTRA-LIMITAL.*)

V. pupoidea. (Gould, Invert. Mass. p. 226, fig. 155.) Shell minute, elevated; whorls four or five, the last nearly disjoined; apex obtuse. *Color*, chesnut. Length, 0·1. Var. of the preceding? *Massachusetts.*

GENUS NATICA. *Bruguières.*

Animal: head emarginate in front; two long and pointed tentacles somewhat flattened at their base: eyes sessile, at the external base of these tentacles. Mouth with a labial tooth: no tongue. Foot short, deeply bilobed across in front, exhibiting behind a lobed appendix supporting the opercle. *Shell* smooth, subglobose or orbicular, umbilicated; spire subdepressed; aperture entire, semicircular; inner lip with a callus which modifies the umbilicus, not toothed; lip sharp, smooth within.

Obs. Some shells have been referred to this genns, without an umbilicus; these constitute a subgenus, for which the names *Globulus* and *Globularia* have been proposed.

Natica heros.

PLATE VII. FIG. 148. — FIG. 149. Egg-case.

Natica heros. Say, Journ. Acad. Nat. Sciences, Vol. 5, p. 248.
N. id. Russel, Essex Journal of Nat. Hist. Vol. 1, p. 67.
N. id. Gould, Invertebrata of Mass. p. 233, fig. 165.

Description. Shell large, thick, globular-ovate. Whorls five, convex: spire considerably elevated. Aperture oval; the callus reflected over a small portion of the large, patulous, and coarsely wrinkled umbilicus.

Color. Epidermis thin and yellowish; beneath this, dark reddish mixed with ashen. Aperture dark reddish brown, occasionally tinged with yellowish.

Length, 2·5. Diameter, 2·0.

This is the largest species of the genus, and although found every where along our coast, is less numerous than the following. It is exceedingly voracious, devouring dead fishes, etc., and sometimes reaches to a large size. Dr. Gould speaks of one five inches long, with a breadth of three and three-quarter inches. On the plate 7, fig. 149, is a drawing of a singularly shaped production, which is intended for the protection of the eggs of this and perhaps the following species. It usually occurs in the form figured above, resembling remotely the glass shade of an astral lamp, but the circle is never complete. It is composed of an aggregation of fine particles of sand, connected together by some glutinous substance. It is solid and brittle when found on the dry shore; but when immersed in water, it becomes as flexible as leather: the ova appear to be deposited on the under side. This singular egg-case has long been a puzzle to naturalists, and its true character was first established by Mr. Hogg, who identified similar productions by hatching them from the *N. glaucina* of Europe.

Natica duplicata.

PLATE VII. FIG. 147.

(STATE COLLECTION.)

Natica duplicata. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 247.
N. id. Gould, Invertebrata of Mass. p. 236, fig. 161.

Description. Shell solid, subglobular. Whorls five; the upper whorls not very convex, marked by the lines of growth: aperture oval, oblique; umbilicus irregular, with a deep furrow, and almost entirely covered by a thick callus.

Color. Ashen, with a dark line or band revolving around the spire above the suture, becoming gradually obsolete; within, deep chesnut-brown: callus of the same color.

Length, 1·0 – 2·0. Diameter, 1·0 – 2·1.

This is one of the most common species on the coast.

Natica triseriata.

PLATE VII. FIG. 144.

(STATE COLLECTION.)

Natica triseriata. Say, Journ. Acad. Nat. Sciences, Vol. 5, p. 209.
N. id. Gould, Invertebrata of Mass. p. 233, fig. 165.

Description. Shell longitudinally suboval, nearly globular. Whorls five, convex: spire somewhat elevated; suture slightly impressed; aperture ovate; lip simple, acute; pillar-lip with a thick callus, slightly modifying the umbilicus, which is open, rounded.

Color. Epidermis thin, yellowish: three revolving series of large oblique parallel oblong dark reddish brown spots, about twelve or fourteen in each series; the upper series most usually found on all the whorls: these series are more or less distinctly exhibited within the aperture.

Length, 0·4 – 0·6. Width, 0·3 – 0·5.

This species appears to be very common north of Cape Cod. I have obtained a few specimens from the east end of Long island.

Natica immaculata.

PLATE VII. FIG. 146.

Natica immaculata. Totten, American Journ. Science, Vol. 28, p. 351, fig. 6. a. b. c.
N. id. Gould, Invertebrata of Mass. p. 234, fig. 168.
N. id. Wheatley, Cat. Shells of U. S. No. 695.

Description. Shell small, solid, longitudinally suboval. Whorls about five, the upper ones very slightly convex: apex short and pointed; suture not impressed; the body-whorl convex, and elongated beneath. Aperture narrow, regularly and somewhat acutely curved at the base. Umbilicus rounded and deep, scarcely modified by the callus, which is not very copious, but forms a deposit under the upper part of the lip, and causes a white spiral line to appear externally just below the suture. Opercle horny.

Color. Epidermis thin, greenish yellow; underneath this, milk-white, immaculate.

Length, 0·28. Width, 0·22.

This species was first obtained by Col. Totten, by dredging in deep water near Newport, Rhode-Island. It has since been obtained from the shores of Massachusetts, and, according to Mr. Wheatley, it occurs from Maine to New-York. It is one of the smallest species of the genus, although it has been seen nearly half an inch long.

Natica clausa.

PLATE VII. FIG. 150.

N. clausa. Sowerby, Zool. Journ. Lond Vol. 4, p. 360.
N. consolidata. Couthouy, Bost. Journ Nat. Hist. Vol. 2, p. 89, pl. 3, fig. 14.
N. clausa. Gould, Invertebrata of Mass. p. 238, fig. 167.

Description. Shell subglobose. Whorls four or five, subconvex, partially flattened, or even concave near the sutures: spire very short, obtuse: suture distinct; aperture oval, widest above; lip sharp, thickened and rounded towards the umbilicus; callus depressed, enlarged at the upper angle, and in mature specimens quite concealing the umbilicus. Opercle calcareous, smooth, with microscopic radiating striæ.

Color. Epidermis thin, greenish brown; underneath varying from dull white to dark reddish or brown. Opercle milk-white; throat white.

Length, 0·3 – 0·5. Width, 0·4 – 0·55.

This arctic species has not yet been observed on our shores, although it has been obtained from the stomachs of fishes along the coast. It was first detected by Mr. Couthouy of Boston, who named it *consolidata*, without being aware of the previous labors of Messrs. Broderip and Sowerby on this subject. It will, in all probability, be detected in the stomachs of fishes along the coast of New-York.

Natica pusilla.

PLATE VII. FIG. 145.

Natica pusilla. Say, Journ. Acad. Nat. Sc. Vol. 2, p. 237.
N. id. Gould, Invertebrata of Mass. p. 237, fig. 166.

Description. Shell suboval, smooth, glossy, or with faint incremental and revolving lines. Whorls four, regularly rounded: spire moderately elevated, obtuse; suture distinct and deep; lip sharp, acute; callus pressed laterally into the umbilicus, leaving a narrow curved linear opening; opercle horny.

Color. Epidermis ash-colored; underneath bluish white: throat white.

Length, 0·5. Width, 0·8.

I received specimens from several collections, labelled "*N. pusilla*, Say," and gathered many identical with them at Glasshouse point, near the city. I am now convinced that they were either young of *duplicata*, or a species of *Margarita*, allied to, if not identical with *M. inflata*. I have therefore adopted from Dr. Gould his figure and description, with the observation that the true *pusilla* as yet has only been obtained from the stomachs of fishes along the coast, inhabiting deep water, and is probably a boreal species.

Natica flava.

N. flava. Gould, Am. Jour. Vol. 33, p. 196; Invertebrata of Mass. p. 239, fig. 162.

Description. Shell globular, inflated, thin and light. Whorls four, rounded, slightly compressed above near the suture, with very minute incremental and revolving striæ: spire little elevated. Pillar-lip with a curve in its middle; the callus contracting and obliterating the umbilicus, which is deeply indented.

Color. Epidermis light yellowish; white underneath: callus ivory white.

Length, 0·1; width rather less.

This shell was obtained by Col. Totten from the Bank fishing grounds, and first described by Dr. Gould. The absence of an umbilicus, which is one of the characters of the genus, suggests the propriety of modifying it so as to admit this species, or to place it under a new subgenus. There are three other American species, which figure in the catalogues under the names of *N. canrena*, Lam., *alba* and *lunata*, Say. The first is European, or rather Asiatic. I can find no descriptions of the other two species, which are said to be found along the Southern coast. For the fossil species, consult the *Journal of the Academy of Natural Sciences*, Vols. 4 and 6.

FAMILY TROCHIDÆ.

ANIMAL *with two contractile tentacles: eyes at their external bases, pedunculated. Marine and fluviatile.* SHELL *very variable in form; aperture occasionally with its edges disunited, but not forming a canal, and but rarely with a sinus in front.*

(*EXTRA-LIMITAL.*)

Genus AMPULLARIA, *Lamarck.* Shell globular, ventricose, umbilicated: aperture oblong, entire; margins united: no callosity on the pillar-lip. Lip acute, not reflected. An opercle. Aquatic, fluviatile.

A. hopetonensis. (LEA, Tr. Am. Phil. Vol. 5, pl. 19, fig. 84.) Shell smooth, flattened above, umbilicate, banded; sutures impressed; whorls five; aperture subovate. *Color*, yellowish or dusky brown; aperture white. Length, 1·7; diameter, 1·4. *Georgia.*

A. rotundata. (SAY, Des. terr. & fluv. shells, p. 22.) Shell very globose; spire little elevated; body-whorl undulated, instead of being wrinkled; aperture on the margin within, thickened equally all round, with a slight groove for the opercle; umbilicus small, narrow. Length, 1·8; width, 1·8. *Florida.*

A. paludosa et *depressa.* (SAY, Exped. St. Peter's, Vol. 2, p. 264, pl. 14, fig. 2. *A. paludosa*, ID. MSS. *penesma* et *disseminata.*) Whorls four, slightly wrinkled; body-whorl more prominent above, somewhat flattened towards the suture; spire very much depressed; aperture oval, exhibiting the bands on the margin; umbilicus small, nearly closed. *Color*, pale olivaceous, obsoletely banded with obscure green, with numerous vertical and transverse greenish and brown lines; aperture somewhat glaucous. Length, 1·5; of aperture, 1·2. *Florida.*

GENUS JANTHINA. *Lamarck.*

Animal with a large head and extended snout, with the mouth at its extremity; the latter with two vertical cartilaginous lips, armed with long recurved spines. Tentacles two, conic, pointed, distant, and scarcely contractile. Eyes beneath the extremities of moderately long peduncles, which arise from the outer base of the tentacles. Foot oval, in two portions: the anterior concave and sucker-shaped; the posterior flattened, thick and fleshy. Swimming appendages lateral, broad and fringed, consisting of a congeries of vesicles. Breathing cavity patulous, with two branchial pectinated series; orifice of the ovaries in this cavity: male organ small, on the right side. *Shell* thin, brittle, globular or conoidal, ventricose; spire low; aperture angular at the junction of the lips beneath; pillar-lip twisted; lip with a sinus at the middle: all the species yet known, of a violet color. Opercle represented by a vesicular appendage attached to the posterior portion of the foot.

Janthina fragilis.

PLATE XXXVI. FIG. 360.

Janthina fragilis. Brug. Encycloped. Methodique, pl. 456, fig. 1.
J. *id.* Gould, Invertebrata of Mass. p. 240.

Description. Shell globose-conic, with a short spire. Body-whorl large, angulated in the middle: surface shining, with incremental wrinkled lines, and with revolving lines beneath the angle; aperture large, semioval; lip retiring as it passes the angle of the whorl; pillar-lip straight.

Color. Deep violet beneath the angle; lighter above.

Length, 0·8. Width, 1·0.

This shell is never found on our shores, unless driven by heavy storms. In the autumn of 1839, according to Dr. Gould, great numbers were thus thrown upon the shores of Nantucket.

GENUS SCALARIA. *Lamarck.*

Animal furnished with a proboscis, with two tentacles ending in filaments, and with the eyes on an external tubercle. Foot short and oval; the male organ very slender. Marine. *Shell* turreted, elongated; whorls rounded, with longitudinal subacute elevated ribs; aperture rounded, the margin reflected, continuous. Opercle horny, thin, paucispiral.

Obs. The animal of this genus is yet incompletely known. We are chiefly indebted to Messrs. Say and Couthouy for our knowledge of the American species.

Scalaria subulata.

PLATE VI. FIG. 124. A. B.

(STATE COLLECTION.)

Scalaria subulata. Couthouy, Bost. Journ. Nat. Hist. Vol. 2, p. 91, pl. 3, fig. 4.
S. *id.* Russell, Essex Journ. Nat. Hist. Vol. 1, p. 75.
S. *grœnlandica.* Gould, Invertebrata of Mass. p. 249, fig. 170.

Description. Shell tapering to a fine point, imperforate. Whorls nine or ten, contiguous, slightly convex, with eight to fifteen stout compressed oblique ribs, with intervening coarse rounded vertical ridges, and seven or eight revolving striæ; the ribs not ending abruptly at the suture, but flowing along the sutural region to the preceding ones. Aperture nearly circular, bordered by a rib which is emarginate at the base. Opercle horny, shining.

Color. Dull bluish white to livid brown; lip and ribs white. *Animal* yellowish grey, with whitish spots; mouth rather large, rounded, corrugated.

Length, 1·0. Width, 0·35.

This species was first detected by Mr. Couthouy in the stomachs of fishes off the coast of Massachusetts, and subsequently along the shores. It is a boreal species, which will probably be found on our own coast. On the authority of Mr. Sowerby, this species has been referred to the *Turbo clathrus-grœnlandicus* of Chemnitz.

Scalaria lineata.

PLATE VI. FIG. 125.

Scalaria lineata. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 242.
S. *id.* Id. American Conchology, p. 27.
S. *id.* Gould, Invertebrata of Mass. p. 250.

Description. Shell elongated, conical. Whorls seven or eight, rounded; body-whorl with an elevated revolving line, which is lost in the sutures above; from sixteen to eighteen robust obtuse ribs. Aperture subcircular, with a strong rounded lip, which is more dilated at the base. No umbilicus.

Color. White or brownish, with one or more revolving bands on the body-whorl.

Length, 0·5. Width, 0·2.

This species, together with the following, have been found from the coast of the Southern States to Massachusetts. I am not aware that it has yet been observed on our own coast. The northern specimens appear to be less robust, and with more delicate ribs than those noticed by Mr. Say.

Scalaria multistriata.

Scalaria multistriata. Say, Jour. Acad. Nat. Sciences, Vol. 5, p. 208.
S. *id.* Id. American Conchology, pl. 27.
S. *id.* Gould, Invertebrata of Mass. p. 251.

Description. Shell solid, tapering to an acute apex. Whorls eight, very convex: suture distinct; ribs regular, equidistant, varying from fourteen to twenty in number, and obsolete on the three terminal whorls: the spaces between the ribs with numerous fine revolving lines. Aperture oval, margined by a rib. Umbilicus none.

Length, 0·5. Width, 0·15.

The northern and southern specimens of this shell exhibit some differences, but scarcely sufficient to warrant the creation of a new species.

(*EXTRA-LIMITAL.*)

S. novangliæ. (COUTHOUY, Bost. Journ. Vol. 2, p. 96, pl. 3, fig. 5. PL. 6, fig. 126 of this book.) Shell with the whorls scarcely in contact. Whorls 10, crossed by about 11 delicate ribs, each forming a little spine in the suture above: intervening spaces with numerous minute revolving lines. Umbilicus small. *Color*, glossy white or faint bluish white, with a few rusty blotches. Length, 0·7; width, 0·25. From the stomach of a fish off Cape Ann. A single specimen only known.

S. clathrus, LIN. (SAY, Jour. Ac. Nat. Sc. Vol. 5, p. 208; Am. Conch. pl. 27, var. c.) Shell conic, imperforate: whorls 6 – 11, touching each other only by the ribs, but with a very narrow interval; ribs 9, simple, slightly oblique, with a more or less obvious obtuse angle or shoulder above, near the suture; aperture oval-orbicular, a little angulated at the base; lip distinct. *Color*, white immaculate. Length, 0·6 – 0·9. *Southern Coast.*

S. turbinata. (CONRAD, Jour. Ac. Sc. Vol. 7, p. 263, pl. 20, fig. 26.) Shell with the body-whorl dilated: ribs lamellar, strong, very prominent, slightly reflected, terminating above in a prominent angle. *Color*, white. *From deep waters off the coast of North-Carolina.*

S. humphreysii, KIENER.

GENUS TORNATELLA. *Lamarck.*

Shell oval, spirally grooved: whorls few. Aperture long, narrow, rounded beneath. Lip thin; pillar-lip twisted spirally to form a fold.

TORNATELLA PUNCTOSTRIATA.

PLATE VII. FIG. 143.

(STATE COLLECTION.)

Tornatella puncto-striata. ADAMS, Bost. Journ. Nat. Hist. Vol. 3, p. 323, pl. 3, fig.
T. id. GOULD, Invertebrata of Mass. p 245, fig. 188.

Description. Shell minute, suboval, polished. Whorls four to five: body-whorl large, smooth above the aperture; beneath it, with ten to fifteen punctate revolving lines. Spire short, rapidly diminishing, with a shoulder near the suture: suture deeply impressed. Aperture two-thirds of the length of the body-whorl, narrow, becoming wider beneath: pillar-lip with a prominent fold. Umbilicus open in the young, partly covered by the reflected margin in the adult.

Color. White.

Length, 0·1 – 0·15.

This species occurs in the mud just below low-water mark in the harbor of New-York, where it was found by Dr. Budd. It has also been found by Dr. C. H. Stillman, in the East river, opposite Williamsburgh. It likewise occurs on the coast of Massachusetts.

(*EXTRA-LIMITAL.*)

Genus PIRENA, *Lamarck.* *Animal* with an elongated rostrum: tentacles two, contractile, conic, annulated, with the eyes on peduncles at their external bases; foot short, oval, angular in front on each side; breathing-hole in the furrow, formed by the union of the mouth with the body. Fresh water. *Shell* turreted; aperture longitudinal. Lip acute, with a distinct sinus at the base, and another at its junction with the body: base of the columella turned towards the right. Opercle horny, subspiral.

P. scalariformis. (SAY, Ac. Sc. Vol. 5, p. 128.) Whorls rounded, with numerous elevated lines, ending the body-whorl by 5 – 6 revolving grooves: suture well impressed, with one of the grooves so near as to cause it to appear double; aperture rounded; lip thickened, somewhat recurved; sinus slight at the base, more obtuse above. No umbilicus. *Color*, pale, with several revolving reddish lines. Length, 0·9. *Florida Keys.*

FAMILY CERITHIDÆ.

ANIMAL *with an elongated rostrum, without a trunk, but surmounted by a veil. Tentacles with the eyes about their middle, and externally. Inhabiting salt water.* SHELL *elongated, with the aperture much shorter than the remainder of its length. Opercle horny.*

OBS. This comprises a portion of the family *Canalifera* of Lamarck.

GENUS CERITHIUM. *Adanson.*

Animal elongated, spiral, with its rostrum depressed, and covered by a veil which is often fringed. Tentacles distant, annulated, and bearing the eyes on a protuberance near the middle. Mouth without teeth, but with a small tongue. Foot short, oval, with a marginal furrow in front. Mantle forming on the left side a canal, or the rudiment of a syphon. Branchial cavity with a single gill, which is long and narrow. *Shell* turreted, elongated, almost always tuberculated. Aperture short, oval, oblique, with a short recurved often truncated canal.

CERITHIUM SAYI.

PLATE VIII. FIG. 167.

(STATE COLLECTION.)

Pasithea nigra. TOTTEN, Am. Jour. Sc. Vol 26, p. 369, pl. 1, fig. 7. (Young.)
Cerithium reticulatum. ID. Ib. Vol. 28, p. 352, fig. 8.
C. id. ADAMS, Bost. Journ. Nat. Hist. Vol. 2, p. 273.
C. sayi. GOULD, from *Menke*, Invertebrata of Mass. p. 278, fig. 183.

Description. Shell small, acute, conic, thin. Whorls from six to eight, flat, with a distinct shoulder, formed by a series of granules. Surface granular, from the crossing of slightly

elevated folds with elevated spiral lines: about twenty of these ribs, which disappear on the lower half of the body-whorl, leaving there only about six slightly elevated revolving lines. Suture deeply impressed. Aperture about a fourth of the length of the shell, elongate, subovate, acutely angular above, widely rounded below, slightly effuse. Lip sharp, modified by the revolving lines; the canal, if it can be said to exist, is a mere oblique fissure. Opercle horny, ovate, concave externally, multispiral.

Color. Bluish black to reddish black.

Length, 0·2 – 0·3. Width, 0·1.

This species was first described by Col. Totten, from immature specimens, and referred to *Pasithea.* The subsequent acquisition of full grown shells enabled him to refer it to the present genus, where, however, it is not likely long to remain. The imperfect development of the canal may probably induce some writers to refer it to *Potamida* of Brongniart, or to construct a new and closely allied genus.

This shell is common on the shores of this State. In some specimens collected by Dr. Stillman, the upper whorls are blackish, and furnished with distinct vertical elevated lines; on the three lower whorls, the revolving lines are very distinct, the color light brown, with rufous elevated vertical lines.

(*EXTRA-LIMITAL.*)

C. ferrugineum. (Say, Am. Conch. pl. 49, fig. 3.) Whorls 7, with longitudinal ribs, rendered nodulous by spiral striæ. About 20 ribs on the body-whorl, almost interrupted by the interstices of the striæ. Striæ 7 on the body-whorl, with intermediate smaller ones; 3 on the second whorl: suture not very distinct. Aperture oblique, oval; lip somewhat thickened on the outer margin. *Color*, ferruginous; within whitish. *Florida.*

C. emersonii. (Adams, Bost. Jour. Vol. 2, p. 284, pl. 4, fig. 10. Gould, fig. 180. Pl. 8, fig. 168 of this book.) Shell long, conical: whorls 17, flat, each with three rows of granules; suture very deeply impressed; aperture small, subquadrate, about one-sixth the length of the shell; columella spirally twisted; canal less than half the length of the aperture. *Color*, dark reddish brown. Length, 0·5; width, 0·12. *Nantucket.*

C. septemstriatum. (Say, Am. Conchol. pl. 49.) Shell turreted, with ribs made somewhat nodulous by elevated spiral striæ. Ribs about 13 on the body-whorl, bifid towards the base. Spiral striæ 7 on the body-whorl, 7 on the second, and 3 on the third: volutions 9. *Color*, dusky or blackish; the interstices of the striæ often whitish. Lip whitish, often interrupted by small brown lines. *Florida.*

C. nigrocinctum. (Adams, l. c. Vol. 2, p. 286, pl. 4, fig. 11.) Shell small, conic-cylindrical, with 3 revolving series of granules. Whorls reversed or heterostrophe; suture broad, carinate; aperture small, subelliptical, ending in a twisted canal about one-third as long as the aperture. *Color*, reddish black; columella black: a black spiral belt in faded shells. Length, 0·3; width, 0·07. *Massachusetts.*

C. terebrale. (Id. Ib. Vol. 3, p. 320, pl. 3, fig. 7. Pl. 8, fig. 172 of this book.) Whorls 10 – 12, flattened, with three or four elevated revolving ridges on each, with numerous fine longitudinal lines between the ridges. Base of the shell abrupt: aperture oval, about one-eighth of the length of the shell; canal very short. *Color*, reddish brown. Length, 0·5; width, 0·12. *Massachusetts.*

C. greeni. (Id. Ib. Vol. 2, p. 287, pl. 4, fig. 12.) Shell very small, cylindrical; beneath, deeply rugose, with longitudinal ridges and revolving lines. Canal very deep and very short, slightly curved. Aperture one-eighth of the shell, nearly circular. *Color*, reddish brown. Length, 0·2; width, 0·05. *Massachusetts.*

C. muscarum. (Say, Am. Conchol. pl. 49, fig. 1.) With distant longitudinal prominent ribs, with spiral striæ, which give them a crenate appearance. Striæ 5 on the body-whorl, 4 on the second, with smaller parallel striæ: ribs 11 on the body-whorl. Whorls 9, somewhat convex; suture indented, distinct; aperture oblique, oval-orbicular; pillar-lip concave. *Color*, white, with reddish brown longitudinal and spiral spots. *Florida.*

FAMILY PURPURIDÆ.

Animal *furnished with a trunk, but not with a veil. Tentacles with the eyes on their middle portion, and external. Marine.* Shell *very variable in its shape, furnished with a notch, or more generally with a straight or recurved canal. Opercle horny.*

GENUS BUCCINUM. *Adanson.*

Animal without any labial tooth. Middle portion of the tentacles dilated externally for the eyes: foot short, rounded in front. Mantle furnished with a long canal in front of the respiratory cavity, which latter contains two unequal series of gills: oviduct terminating on the right, at the entrance of the branchial cavity. Male organ long, flattened, and on the right side of the neck: vent on the right side in front. *Shell* ovate-conic: aperture having a notch, without a canal in front; pillar not flattened, somewhat twisted. Opercle horny, oval, with concentric elements; the summit marginal.

Buccinum undatum.

PLATE VII. FIG. 161.

(STATE COLLECTION.)

Buccinum undatum.	Lin. Syst. Nat. p. 1201.	Muller, Zool. Danica, p. 12, pl. 50.
B.	*id.*	Russel, Essex Journ. of Nat. Hist. Vol. 1, p. 69.
B.	*id.*	Gould, Invertebrata of Massachusetts, p. 305.

Description. Shell solid, ovate-oblong. Whorls six or seven, regularly convex, rapidly terminating in an acute apex; upper whorls with stout vertical broad plaits or folds, becoming

effaced on the body-whorl: these folds are crossed by numerous, elevated, angular, distant, revolving ribs; the interstitical spaces reticulate, with revolving and vertical elevated lines. Aperture oblong-oval, rather more than one-half of the length of the shell; its base emarginate. Columella arched, furnished with a broad callus, and twisted on its lower portion. Lip attenuated at the margin, slightly everted, and festooned by the terminations of the revolving ribs.

Color. Epidermis olivaceous brown, velvety; beneath light reddish white: aperture yellowish or soiled white.

Length, 2·0 – 5·0; of aperture, 1·2 – 2·6.

This species occurs on both shores of the Northern Atlantic. On this coast it has been found from New-York to Maine, and farther north. On the coast of this State, it is a rare shell.

Buccinum lunatum.

PLATE VII. FIG. 162.*

(STATE COLLECTION.)

Nassa lunata. Say, Journ. Acad. Nat. Sciences, Vol. 5, p. 213.
Buccinum lunatum. Adams, Bost. Journ. Nat. Hist. Vol. 2, p. 266.
B. id. Gould, Invertebrata of Mass. p. 312, fig. 196.

Description. Shell very small, conic-oval. Whorls six, nearly smooth, slightly convex: a single revolving line below the suture, and a few around the base; suture not deeply impressed. Aperture narrow, slightly angulated above, and with a short channel beneath. Columella with a callus: lip simple, dentate on its inner margin; those above most prominent.

Color. Reddish brown or yellowish, with one or more series of sublunate white spots on the body-whorl; occasionally uniform reddish brown. "Animal with the trunk more than half as long as the shell: eyes placed on the base? of the tentacles" (Say).

Length, 0·2. Width, 0·1.

This species has been found from Georgia to Cape Cod, adhering to stones and seaweed below low-water mark. It is subject to great variations of form and coloring, and perhaps the following may be considered as identical with this species.

Buccinum wheatleyi.

PLATE VII. FIG. 162. Magnified.

(STATE COLLECTION.)

Description. Shell minute, small, ovate-subcylindrical. Whorls six, nearly flat, or at most very slightly covex, with a small and distinct suture: surface smooth, with no revolving lines. Aperture narrow, sublinear, with a small notch above and a short canal beneath. Body-whorl, on its lower portion near the canal, has from eight to ten minute impressed revolving striæ, becoming more distant above. Lip simple, thin, with a ridge of minute teeth within its inner edge, which are entirely wanting in the young. Callus on the columella elevated, not much reflected.

Color. Light horn, with numerous undulated vertical reddish dilated lines.

Length, 0·23; of aperture, 0·1.

These shells were dredged by Mr. Charles M. Wheatley, from the harbor of New-York, in five fathom water, opposite Staten island. It is closely allied to *B. lunatum*, but appears to differ by the absence of the subsutural revolving line, and the revolving colored lines: the revolving lines at the base are more numerous and distinct.

Buccinum trivittatum.

PLATE VIII. FIG. 165.

(STATE COLLECTION.)

Nassa	*trivittata.*	Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 321.
Buccinum	*id.*	Russel, Essex Jour. Nat. Hist. Vol. 1, p. 68.
B.	*id.*	Adams, Boston Journ. Nat. Hist. Vol. 2, p. 265.
B.	*id.*	Gould, Invertebrata of Mass. p. 309, fig. 211.

Description. Shell robust, ovate-conic: spire elevated, acute, longer than the body-whorl. Whorls six or seven, flattened: surface granulated by prominent vertical lines, and about ten revolving impressed lines. Suture impressed, with a prominent shoulder on the whorl near it. Aperture oval, with a notch above, and a slightly reflected process or beak beneath, separated from the body by a groove which forms a notch beneath: lip sharp, scolloped with the revolving lines; pillar-lip with a slight fold beneath. Opercle subtriangular, dentate around the margin.

Color. Whitish or reddish white and yellowish, with three or more revolving brown or reddish bands.

Length, 0·5; of aperture, 0·2.

The colored revolving lines, in the specimens on our coast, are not of common occurrence. They are occasionally larger than the dimensions stated above. I have seen them, in the collection of Dr. Stillman, 0·8 long. The young have the body-whorl much dilated, and the

suture very distinct. The aperture of the dead shell is often found filled up with a conica mound of fine particles of sand, with a large aperture at the summit: in this state, it is evidently the abode of some other marine animal. I have received from Col. Totten similar specimens, dredged from fifteen to twenty fathoms in Narragansett bay. In these, Col. Totten noticed the protrusion of a proboscis capable of being extended one inch.

Buccinum obsoletum.

PLATE VIII. FIG. 163. A. B. — FIG. 164, VAR.

(STATE COLLECTION.)

Nassa obsoleta. SAY, Jour. Acad. Nat. Sciences, Vol. 2, p. 232.
Buccinum noveboracencis. WOOD, Index Suppl. pl. 4, fig. 26.
B. olivæformis. KIENER, Iconographie, pl. 25, fig. 99.
B. obsoletum. ADAMS, Bost. Jour. Nat. Hist. Vol. 2, p. 267.
B. id. GOULD, Invertebrata of Mass. p. 208, fig. 210.

Description. Shell ovate-conic, subacute. Whorls six, convex: surface reticulated by vertical and revolving lines, and cancellate by oblique folds; body-whorl often deeply rugose vertically; suture distinct, but not deeply impressed. Aperture oval: lip sharp, simple, with a few elevated lines not reaching the margin in the adult, and a broad prominence beneath. Pillar-lip arched, with a broad callus, and a prominence or fold at its base.

Color. Dark olive or reddish brown: lip purple, black. *Animal* mottled with slate: trunk half as long as the shell: tentacles above the eyes, suddenly smaller, and thread-like.

Length, 0·6 – 1·0. Width, 0·2 – 0·55.

Var. A. (fig. 164), with a light colored or bluish white band on the body-whorl.

This voracious little animal is found along our whole coast, to the shores of Mexico. It is one of our most common species.

Buccinum vibex.

Nassa vibex. SAY, Jour. Acad. Nat. Sc. Vol. 2, p. 231; Am. Conch. pl. 57, fig. 2.
Buccinum vibex. ADAMS, Bost. Jour. Nat. Hist. pl. 2, p. 266.
B. id. GOULD, Invertebrata of Mass. p. 310, fig. 212.

Description. Shell solid, ovate, short. Whorls six: body-whorl with from ten to twelve vertical undulating and prominent costæ, which are continued to the apex; and about the same number of revolving lines, which are most prominent on the costæ: suture moderate. Aperture oval: lip incrassated without and within, with two to four prominent teeth internally; pillar-lip arched with a broad flat callus, which forms a process directed upwards towards the suture on the upper portion of the body-whorl, and is slightly granulated at the base. Spire short, rapidly attenuated to an acute apex: canal very short.

Color. Ashy white to pale reddish brown, with darker colored revolving bands.

Length, 0·5 – 0·6. Width, 0·3 – 0·35.

This species ranges from Cape Cod to the Gulf of Mexico. It is not very common on our shores. The first three species in the following list have only been obtained from the stomachs of fishes; and as they may be also detected under the same circumstances along our coast, I have annexed figures taken from the book of Dr. Gould.

(*EXTRA-LIMITAL.*)

B. donovani. (Gould, l. c. p. 304, fig. 208.) Shell large, ovate-conic, elevated and pointed. Whorls folded lengthwise, and marked with revolving lines; lowest whorl surrounded by a rounded keel; aperture rounded; lip spreading. *Color*, soiled brown; throat livid. Length, 2·0; width, 1·0.

B. ciliatum. (Id. Ib. p. 307, fig. 209.) Shell ovate-conic, ventricose, thin. Whorls six or eight, sometimes folded at the suture, spirally striated: epidermis hispid. *Color*, ash or clouded with brown. Length, 2·0; width, 1·3.

B. rosaceum. (Id. l. c. fig. 195.) Shell small, acutely conic: whorls six, covered with spiral lines; aperture ovate, shorter than the spire; pillar arched and flattened; lip sharp, and without teeth within.

B. acutum. (Say, Ac. Sc. Vol. 2, p. 234; Am. Conch. pl. 57, fig. 3.) Conic-acute, cancellate, so as to appear granulate; granules prominent, somewhat transverse, inequidistant. Spiral grooves six in number: spire longer than the body-whorl, slender, acute. Beak distinguished by a depression from the body-whorl, and slightly reflected; lip thickened, with elevated lines on the fauces, not attaining the margin. *Color*, whitish. Length, 0·5. *Southern Coast.*

Obs. According to Mr. Couthouy, this is common in the stomachs of fishes captured on the coast of Massachusetts.

B. unicinctum. (Id. Ib. Vol. 5, p. 211; Am. Conch. pl. 57, fig. 1. Subovate, conical. Whorls 8, with 10 – 12 revolving lines and transverse undulations; apex acute; lip with ten revolving striæ within; pillar-lip concave in the middle; two obsolete striæ and a deeper one at the base. *Color*, yellowish white or ash grey: body-whorl with a brown band. Length, 0·9. *South Carolina.*

B. ornatum. (Id. Ib. Vol. 2, p. 229.) Subturbinated, with about two bands of arched scales. Whorls flattened above the shoulder, which has undulated scales resembling raised concave spines: aperture effuse; numerous revolving striæ and grooves. *Color*, whitish ash, with rufous bands; throat varied with pale green and yellowish, the rufous bands being very distant. Length, 4·0; aperture, 2·7. *Southern coast.*

B. album. (Id. Ib. Vol. 5, p. 212.) Ovate, longitudinally ribbed or undulated, and with spiral striæ. Whorls seven, convex: 10 – 18 equidistant ribs on the body-whorl, and 17 – 20 striæ; suture deeply indented; lip with a larger rib than the others on the exterior, and striate within. Aperture suborbicular. Pillar-lip plate distinct, entire, but not expanded, with an indented line near the base, and a prominent one near the junction with the lip. Length, 0·4. *Florida.*

GENUS PURPURA. *Adanson.*

Animal with a large head. Trunk short or obsolete. Tentacles two, generally in front and approximated, conical, and with the eyes on an inflated portion near the middle, and external. Mouth beneath, almost always concealed by the foot. Foot moderately large, advanced and bilobed in front. Mantle forming a distinct siphon in front. Gills in two unequal series. Orifice of the oviduct at the entrance of the branchial cavity; that of the vas deferens on the right side of the neck, at the end of the male organ, which is generally voluminous. Vent on the same side. Marine. *Shell*, ovate, thick, smooth, tubular or angular: spire short; aperture dilated, emarginate at the base, having a subcanaliculate oblique sinus. Columella depressed, ending in a point.

Purpura lapillus.

PLATE VIII. FIG. 175.

(STATE COLLECTION.)

Buccinum lapillus. Lin. Gmel. Syst. Nat. 1202. Lam. An. sans vert. Ed. prior, Vol. 7, p. 244.
Purpura id. Russel, Ess. Journ. Nat. Hist. Vol. 1, p. 69.
P. *id.* Adams, Bost. Journ. Nat. Hist. Vol. 2, p. 268.
P. *id.* Gould, Invertebrata of Mass. p. 301.

Description. Shell ovate, thick and solid: spire short and very acute; suture impressed. Whorls five, with deep revolving furrows and intervening ribs, giving frequently a strong carination to the whorls, which have moreover numerous slight transverse wrinkles. Aperture ovate: lip arched and subacute, with obscure revolving ridges within the margin. Pillar-lip produced, concave externally at the base; canal short. Opercle horny, oval.

Color. Varying from white to lemon and orange yellow; aperture reddish brown within.

Length, 0·6 – 0·8.

This shell occurs along our coast, from Cape Cod to Florida. It is usually described as varying very much in its markings, constituting strongly marked varieties, which have been considered by others as distinct species. Among these are the two following.

Purpura imbricata.

PLATE VIII. FIG. 173.

Purpura imbricata. Lam. An. sans vertèbres, Ed. prior, Vol. 7, p. 244.
P. lapillus, var. Russel, Op. cit. Vol. 1, p, 70. Gould, Op. cit. p. 302.

Description. Shell resembling the preceding in configuration, but more dilated, and not as solid: the spire more rapidly attenuated to the apex; the revolving ribs are more numerous, and rather more distinct; the ribs crossed by numerous waved imbricated scales, extending to the apex. Suture deep: whorls more convex; columella with a broad callus, and its base shorter and broader than in the preceding; lip much rounded, expanded, and crenulated on the margin.

Color. Greenish or greenish mixed with grey.

Length, 0·7 – 1·0; of aperture, 0·5 – 0·7.

Occurs with the preceding. Lamarck observes that it may be only a variety of the preceding, but that it differs eminently by the imbricated scales, which render it rough to the touch.

Purpura bizonalis.

PLATE VIII. FIG. 174.

Purpura bizonalis. Lamarck, An. sans vert. Ed. prior, Vol. 7, p. 249.
P. lapillus, var. Gould, Invertebrata of Mass. p. 303.

Description. Shell rather smaller than the two preceding, solid: spire short, acute. Whorls four to five, with moderate revolving ribs on all except the apicial ones, which are smooth: body-whorl dilated; lip not crenate; base of the columella short, emarginate at its junction with the lip: canal obsolete.

Color. Chocolate-brown, with two revolving white bands, which are most evident on the body-whorl; the upper band broadest.

Length, 0·5 – 0·6.

Occurs with the preceding, but is more rare. In old specimens, the ribs are strongly impressed by the incremental lines.

(*EXTRA-LIMITAL.*)

P. floridana. (Conrad, Ac. Sc. Vol. 7, p. 265, pl. 20, fig. 21.) Shell fusiform: whorls slightly concave above; spiral striæ prominent, unequal. Whorls angular, with a series of tubercles on the angle; those of the spire longitudinally plicate; two terminal whorls smooth: lip thin, furrowed within on the margin. *Color*, varied white and brown; occasionally series of narrow pale stripes with brown spots. *Florida, Alabama.*

GENUS TRICHOTROPIS. *Broderip and Sowerby.*

Shell turbinate, thin, ventricose, keeled and umbilicate. Aperture longer than the spire, compressed into a partial canal beneath: outer lip thin, sharp. Epidermis horny, produced into long hairs at the angles of the shell. Opercle horny, with the nucleus lateral. *Animal* undescribed.

TRICHOTROPIS BOREALIS.

PLATE VIII. FIG. 178. A. B.

Trichotropis borealis. SOWERBY, Zool. Jour. Lond. Vol. 4, p. 373, pl. 9, figs. 6, 7.
T. *costellatus.* COUTHOUY, Bost. Jour. Nat. Hist. Vol. 2, p. 108, pl. 3, fig. 2.
T. *borealis.* GOULD, Invertebrata of Mass. p. 300, fig. 207.

Description. Shell ovate, acutely turreted. Whorls six (four according to Dr. Gould), separated by a deeply channelled suture; the last whorl larger than all the others, with two to four prominent revolving ribs with intermediate striæ; the two largest ribs only continued on the upper whorls, which are thereby angulated: numerous minute vertical striæ. Aperture oblong-oval, rounded and broad above: lip thin, acute, distinctly indented, and festooned by the ribs. Columella arcuated with a slight projection near its lower third, and abruptly compressed near its base, meeting the lip at an acute angle, forming a very short canal. Umbilicus slight, bounded externally by a revolving imbricated ridge. Epidermis horny, elongated into bristles along the ribs.

Color. Epidermis whitish yellow; beneath this, brownish or yellowish white.

Length, 0·75. Width, 0·45.

This shell was first obtained from Melville island, and afterwards from the coast of Scotland, by Mr. Sowerby. It was subsequently obtained by Mr. Couthouy, from the stomachs of fishes off the coast of Massachusetts, and, in similar situations, will undoubtedly be found here. The species described by Mr. Couthouy, he supposes to be distinct from the *borealis*, by the greater breadth of the body-whorl of that species, its fewer number of ribs, and the more conspicuous bristly fringe. Later conchological writers, together with Mr. Sowerby himself, consider these two as indentical.

GENUS CANCELLARIA. *Lamarck.*

Animal with a large head, and resembling that of *Purpura*. *Shell* solid, oval or globular, cancellated. Spire little elevated, pointed. Aperture semioval, notched or subcanaliculate at the base. Canal very short, almost none. Columella nearly straight, with prominent plaits or folds varying in number, usually transverse: lip internally furrowed. Opercle horny.

CANCELLARIA COUTHOUYI.

PLATE VII. FIG. 160.

(STATE COLLECTION.)

Cancellaria buccinoides. COUTHOUY, Bost. Jour. Nat. Hist. Vol. 2, p. 105, pl. 3, fig. 3.
C. couthouyi. JAY, Cat. GOULD, Invertebrata of Mass. p. 233, fig. 190.

Description. Shell ovate-conic, subturreted; apex acute. Whorls five to seven, convex, flattened above, reticulated, with transverse furrows, and plaited longitudinally, these plaits becoming occasionally distinct elevated folds: suture distinct and deep. Body-whorl forming two-thirds of the total length, and ventricose. Aperture oval, half the total length, effuse at the base, and subcanaliculate. Lip thin, acute, slightly crenulate on the inner edge; the internal striæ indistinct. Columella arched, with three oblique folds; the central one somewhat longest. A callus, more or less distinct, on the body-whorl.

Color. Epidermis thin, olivaceous; under which the shell is opake white.

Length, 0·55; of aperture, 0·35.

Mr. Couthouy, the original describer of this species, was not aware that the same specific name had been applied by Mr. Sowerby to a *Cancellaria* from the Pacific ocean. Hence the present name, which, although implying a merited compliment, is, as Dr. Gould observes, in conformity with a bad custom. It is an arctic species, and hence it is not probable will be found along our shores, except under the same circumstances in which it occurs on the coast of Massachusetts, viz. in the stomachs of fishes. In the specimens to which I have had access, the strong folds on the whorls are not so distinctly elevated as in the figure and description of Mr. Couthouy. According to the same writer, the lip has no internal striæ; but they were observed by me, although indistinct.

GENUS RANELLA. *Lamarck.*

Animal unknown, but supposed to resemble that of *Murex*. *Shell* thick, oval-oblong, nodulous, having a series of varices on each side, formed at each half revolution. Aperture oval above, ending in a notch above and a straight canal beneath: lip thickened. Opercle unknown.

Ranella caudata.

PLATE VIII. FIG. 176. A. B.

(STATE COLLECTION.)

Ranella	*caudata.*	Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 236.
R.	*id.*	Id. American Conchology, pl. 48.
R.	*id.*	Adams, Bost. Jour. Nat. Hist. Vol. 2, p. 269.
R.	*id.*	Gould, Invertebrata of Mass. p. 298, fig. 204.

Description. Shell solid. Whorls five, flattened above, cancellate, with eleven stout vertical ribs, of which the one bordering the aperture, and one on the left side of the body-whorl, are enlarged into stout knobs; these are crossed by numerous revolving filiform lines, which form a reticulated surface. Lip thick, bordered within by raised granules. Columella curved, flattened and smooth: canal narrow, deep and almost closed in front, as long as the spire.

Color. Dark reddish brown; internal margin of lip white or bluish white.

Length, 1·0. Width, 0·5.

This animal is common on our shores, and on those of the southern coast. It does not appear to range north of Cape Cod.

GENUS COLOMBELLA. *Lamarck.*

Animal offering the family characteristics, but as yet incompletely known. *Shell* oval: spire short; base of the aperture more or less emarginate, and destitute of a canal; columella plaited; lip thickened by an internal prominence, which narrows the aperture. Opercle horny, elliptical.

Colombella avara.

PLATE VIII. FIG. 179.

(STATE COLLECTION.)

Colombella	*avara.*	Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 230.
C.	*id.*	Adams, Jour. Nat. Hist. Vol. 2, p. 264.
C.	*id.*	Gould, Invertebrata of Mass. p. 313, fig. 197.

Description. Shell thick, small, elongate-ovate; spire elevated and acute. Whorls six or seven, very slightly convex, almost flat: suture distinct. Surface with spiral impressed

lines, and vertical obtuse ribs or folds ; these latter, consisting of about twelve to fourteen in number on the body-whorl, do not descend beyond the middle of that whorl, leaving only revolving lines beneath. Columella with a plate of enamel, which is toothed within, and truncated beneath the margin : lip toothed within.

Color. Whitish, reticulated or spotted with rufous ; often of a yellowish hue.

Length, 0·45 – 0·65. Width, 0·1 – 0·25.

This species occurs on the shores of Staten and Long islands, but is very rare. It abounds on the shores of the Southern States, and extends north to a short distance beyond Cape Cod.

GENUS PYRULA. *Lamarck.*

Animal incompletely known. *Shell* pear-shaped, turbinated or turreted, without varices or umbilicus : body-whorl broad above, thence tapering downward so as to form a long beak. Aperture longer than the spire : pillar more or less twisted.

Pyrula canaliculata.

PLATE IX. FIG. 190.

Murex canaliculatus. Lin. Syst. 12 ed. p. 1222.
Pyrula id. Lam. Vol. 7, p. 137, Ed. prior.
P canaliculata. Adams, Bost. Journ. Nat. Hist. Vol. 2, p. 269.
P. id. Gould, Invertebrata of Mass. p. 294, fig. 206.

Description. Shell ventricose ; apex not much elevated, pointed. Whorls five or six, carinate, flattened above : indications of obsolete varices on the lowest carination. The upper whorls consist of two portions : an upper portion, nearly horizontal ; and a lower, vertical. Suture deeply channelled, with an adjacent carina : numerous impressed revolving lines, particularly distinct on the body-whorl. Aperture oblong-ovate, ending beneath in a long and narrow canal : lip simple, arched, angulated above. Columella smooth, slightly concave above, and indistinctly folded beneath. Opercle oval, small.

Color. Epidermis brown ; beneath which the shell has a faint reddish white color.

Length, 3·5 – 6·0 ; of aperture, including the canal, 2·8 – 4·5.

This is a very common shell on our coast, not extending farther north than Cape Cod : with its southern limits I am not acquainted, but Dr. Gould is inclined to believe that it does not range far south. It is well known, with the following species, as the *Winkle*, and is occasionally eaten. The ovaries are often met with, consisting of a row of broad, circular, parchment-like cases, connected by a ligamentous string often two feet in length. Each case contains one or more of the young, which, when mature, escape from the case by a small hole opposite to the side by which they are held together. When recent, the epidermis is thickly bristled with threads several lines in length, through which, however, the revolving lines may be traced.

Pyrula carica.

PLATE IX. FIG. 192. Adult. — FIG. 193. Young.

Murex carica. Lin. Gmel. 3515.
Pyrula id. Lam. An. sans vert. Vol. 7, p. 138.
P. id. Adams, Bost. Journ. Nat. Hist. Vol. 2, p. 271.
P. id. Gould, Invertebrata of Mass. p. 296.

Description. Adult shell, large, ponderous : spire moderately elevated, acute. Whorls six, nearly plane or subconcave above, with numerous minute revolving striæ ; the three lower volutions with a series of distinct triangular tubercles near the suture : those on the body-whorl nine in number, gradually enlarging to the edge of the outer lip ; on the apicial whorls, obsolete : incremental lines on the body whorl coarse. Columella concave, with a polished callus : aperture oval ; lip arched, dilated ; canal rounded, slightly emarginate.

Color : Epidermis soiled brownish, agglutinating ; within dull orange.

Young shell. Spire more elevated : body-whorl furnished rather with spines than tubercles, which may be traced as far up as the fourth whorl ; revolving striæ more distinct, particularly on the lower part of the body-whorl, and may be traced on the callus above the fold ; the fold on the pillar-lip very distinct, subangular beneath ; extremity of the canal rounded ; aperture irregularly oval, angular above. *Color*, varied with brownish red and white, the reddish spots most apparent near the sutures : a broad light greyish revolving band on the upper portion of the body-whorl ; a similar, but narrower, interrupted and obsolete band beneath ; within varied with brownish red and grey.

Length of adult, 6·0 – 8·0 ; of aperture and canal, 4·8 – 5·5.

Length of young, 2·0 – 4·0.

This shell, as is apparent from the description given above, varies very much in different stages of its growth. It is very common, and the largest of the convoluted shells found on our coast, extending from the shores of the Southern States to Cape Cod. It is sold in our markets as an article of food, at the rate of a dollar a hundred ; but is coarse, and of a strong flavor.

Pyrula spirata.

PLATE VIII. FIG. 180. Adult. — FIG. 181. Young.

Pyrula spirata. Lam. An. sans vert. Ed. prior, Vol. 7, fig. 142.
Fulgur pyruloides. Say, Journ. Acad. Nat. Sc. Vol. 2, p. 237; Am. Conchology, pl. 19.

Description. Adult shell fig-shaped; the carina on the body-whorl nearly obsolete towards the aperture. Whorls six, angular: slight traces of tubercles may be detected on the third, fourth and fifth whorls. Suture deeply channelled. Surface with numerous revolving striæ, which are also very distinct on the inside of the lip: extremity of the canal rounded, subacute; columella sinuous, with two or more folds. *Color*, varied with rufous and yellowish white, with an obsolete yellowish white revolving band on the body-whorl; chesnut-color within the aperture, with traces of parallel dusky revolving bands.

Young. Spire less elevated; the keel distinctly separates the upper from the under portions of the body-whorl, without any vestige of tubercles. Outer striæ equidistant, distinct and subequal; none on the inside of the lip: columella with a single indistinct fold. *Color*, light yellowish, with vertical sinuous subequidistant rufous lines; a faint trace of a light revolving band.

Length, four to four and a half inches.

I have met with this shell in the collections of Dr. Budd and others, but cannot find it authenticated as a New-York species. It occurs probably farther south along the coast.

(*EXTRA-LIMITAL.*)

P. papyratia. (Say, Jour. Acad. Nat. Sc. Vol. 2, p. 238.) Shell thin, inflated. Whorls with numerous spiral striæ, which are alternately larger, and crossed by smaller striæ. *Color*, white, with pale rufous spots; within, pale dull purplish red. Length, 4·1; breadth, 2·1. *Southern Coast.*

GENUS FUSUS. *Lamarck.*

Animal incompletely known, but not differing essentially from that of the *Pyrula*. Marine.

Shell, stout, elongated, fusiform, tapering to both ends, without varices: spire elevated; aperture oval, ending in a straight or slightly curved canal; columella smooth; lip acute, without a notch. Opercle horny, with the nucleus at the smaller end.

FUSUS SCALARIFORMIS.

PLATE VIII. FIG. 182.

(STATE COLLECTION.)

F. scalariformis? GOULD, Invertebrata of Mass. p. 233, fig. 203.

Description. Shell fusiform, elongate, tapering. Whorls six or seven, moderately rounded: suture very distinct. The whole upper surface covered with fifteen prominent equidistant and vertical ribs, which become obsolete on the three upper whorls; the intervening spaces smooth. Lip arched, simple, not crenated. Aperture not quite half of the total length, oblong-oval, and ending in a narrow recurved canal beneath: columella concave.

Color, brownish; white within.

Length, 1.8; of aperture and canal, 0·8.

This shell I had named *F. borealis* many years since, believing it then to be an undescribed shell. It was sent to me from the northern coast. Since the appearance of Dr. Gould's Report on the Shells of Massachusetts, I find that it bears a very close resemblance to the *scalariformis* of that author. The following are the chief differences: In my specimen, the ribs are smooth and solid, without any apperance of being composed of imbricated scales; there is no appearance of revolving lines in the intervening spaces; the beak is not wrinkled, to any apparent degree, by the transverse terminations of the ribs. It is proper, however, to add, that my specimen is old, and apparently weathered. I have received since from the Rev. Mr. Linsley, a specimen 1·2 in length, with the ribs not imbricated, taken in Long-island sound. It is placed, however, under the above name provisionally, until I can have better opportunities for comparison and description.

Fusus islandicus.

PLATE VIII. FIG. 185.

Murex islandicus. Lin. Gmel. Syst. Nat. 3555.
Fusus corneus. Say, American Conchology, pl. 29.
Fusus islandicus. Gould, Invertebrata of Mass. p. 284. Var. *pygmeus*, fig. 199.

Description. Shell elongated, symmetrically fusiform. Spire regularly attenuated to the apex: volutions eight, slightly convex. Body-whorl equally inflated, its surface covered with between forty and fifty small revolving ribs which are conspicuous through the epidermis; these become almost effaced towards the outer lip, when the vertical sinuous striæ appear in their places. These ribs or revolving elevated lines are reduced to fifteen on the next whorl above, diminishing in numbers as we ascend, the intervening furrows becoming more profound, with very faint traces of vertical lines. Aperture oblong-ovate, half the length of the shell: canal short, sinuous and wide. Callus on the columella broad: lip sharp, very minutely impressed by the terminations of the revolving lines.

Color. Epidermis horn-colored or soiled brown: surface beneath, whitish opalescent; within pearly white.

Length, 2·9; of aperture and canal, 1·6.

Dr. Gould has noticed and figured a variety of this shell, which he calls Var. *pygmæus*, 0·8 long, which has six whorls. Mr. Sowerby considers it as a species. Through the kindness of Dr. Jay, I am enabled to describe this shell, which was obtained from the stomachs of codfishes on our coast. Farther north, it is found along the shores. It must be considered as a northern species, as yet not ascertained to occur on the shores of this State.

Fusus ventricosus.

PLATE VIII. FIG. 183.

(STATE COLLECTION.)

Fusus ventricosus. Gray, Beechey's Voyage, Zoology, 117.
F. id. Gould, Invertebrata of Mass. p. 285, fig. 200.

Description. Shell subfusiform, ventricose. Whorls five, rounded, rapidly attenuating to a blunt apex: body-whorl much inflated, composing the greater part of the shell. Surface covered with a velvety epidermis, under which numerous minute and regular revolving lines, with a few vertical wrinkles, are apparent. Spire short, not exceeding 0·4 above the body-whorl: lip simple, smooth; columella with a broad callus; canal slightly recurved.

Color. Epidermis chesnut-color; beneath white.

Length, 1·95; of aperture and canal, 1·45.

I am indebted to Col. Totten for this species, obtained from the stomachs of fishes on the coast, most probably an inhabitant of deep water. I am not aware that it has been actually found on the shores of the United States.

Fusus cinereus.

PLATE VIII. FIG. 184. A. B.

(STATE COLLECTION.)

Fusus cinereus. Say, Acad. Nat. Sciences, Vol. 2, p. 236.
F. id. Id. American Conchology, pl. 29.
F. id. Adams, Bost. Jour. Nat. Hist. Vol. 2, p. 272.
Buccinum plicosum. Gould, Invertebrata of Mass. p. 303, fig. 213.

Description. Shell coarse, subfusiform, moderately solid. Whorls five or six, moderately convex, with ten to twelve revolving raised lines, rendered undulating by numerous coarse rounded vertical ribs: on the body-whorl there are twelve of these revolving lines, and ten ribs; on the spire, the revolving lines decrease and disappear, leaving only the coarse vertical ribs. Aperture semiovate, and, with the canal, exceeding the length of the spire: lip sharp, and festooned by the termination of the revolving lines; columella smooth, polished, slightly arched; canal short, recurved. Opercle horny, with concentric elements.

Color. Epidermis greyish brown; aperture dark purple. *Animal* yellowish, punctured with brownish yellow above.

Length, 1·0; of aperture and canal, 0·5.

This is a common shell on our coast, and is known under the name of *Drill* by our oystermen. They are said to be very destructive to oysters, by piercing or drilling small holes through the shell, and destroying the animal. The means by which this is effected, has not been explained. I have observed them attached to oysters; and upon removing them, a white circular space may be seen at the spot to which they had been attached; and in the centre of this space, a small perforation, not exceeding a pin-hole in size, extending a greater or less distance into the substance of the shell. It appears to extend from the shores of Massachusetts to the coast of the Southern States.

Fusus decemcostatus.

PLATE IX. FIG. 186.

Fusus carinatus? Lamarck, An. sans vert. Vol. 7, p. 126.
F. decemcostatus. Say, Journ. Acad. Nat. Sciences, Vol. 5, p. 214.
F. id. Russel, Essex Journ. Nat. History, Vol. 1, p. 70.
F. id. Gould, Invertebrata of Mass. p. 287, fig. 202

Description. Shell large, robust, solid, somewhat ventricose, oval. Whorls six or seven obliquely flattened above the shoulder, and with stout coarse revolving ribs: there are about ten of these ribs on the body-whorl, gradually diminishing beneath. On the upper whorls, the ribs are reduced to two or three large and coarse ones, which give a turreted appearance to the spire: between these ribs are smaller revolving lines, and the whole surface is coarsely

wrinkled by the lines of growth. Aperture ovate: lip festooned by the termination of the revolving ribs; pillar-lip arched, and with a broad callus; beak cancellate externally; canal short and curved.

Color. Brownish white or ash-colored; pearly white within: grooves on the lip chesnut-colored.

Length, 2·5; of aperture and canal, 1·6.

It is often an inch longer than this, but the proportional dimensions are the same. It is closely allied to *F. carinatus* of Lamarck; but that shell is represented with the lip perfectly smooth, and the reference to Pennant shows a totally differently shell. It occurs in the stomachs of fishes, and has been found, after violent storms, on the shores of Massachusetts and farther north.

Fusus harpularius.

PLATE IX. FIG. 187.

Fusus harpularius. Couthouy. Bost. Journ. Nat. History, Vol. 2, p. 106, pl. 1, fig. 10
F. id. Gould, Invertebrata of Mass. p. 291, fig. 191.

Description. Shell small, fusiform or ovate-oblong, turreted. Whorls six or eight, convex, slightly angular, flattened above: suture distinct. Surface with seventeen to nineteen rounded obliquely vertical folds, crossed by minute revolving lines; these folds become, on the body-whorl, obsolete beneath. Aperture elongate-oval, angular above: lip sharp and smooth within; columella smooth, arched, with a slight callus beneath; canal short, and inclined to the left.

Color. Yellowish white, or brown or orange: columella white.

Length, 0·5. Width, 0·25.

This species was first obtained and described by Mr. Couthouy, from the stomachs of fishes on the northern coast. I am not aware that it has yet been found on the shores of this State.

Fusus rufus.

PLATE IX. FIG. 189. a. NATURAL SIZE; b. MAGNIFIED.

Murex rufus. Montagu, Test. Brit. p. 263.
Fusus pleurotomarius. Couthouy, Bost. Journ. Nat. History, Vol. 2, p. 107, pl. 1, fig. 9.
F. rufus. Gould, Invertebrata of Mass. p. 290, fig. 192.

Description. Shell small, fusiform, elongated, tapering to an acute point: suture distinct. Whorls seven to nine, compressed or very slightly convex, with from seventeen to twenty regular oblique undulating folds, alternating with each other at the sutures: body-whorl with an indistinct shoulder near the suture, and the folds obsolete beneath, their places being occupied by faint revolving lines. Aperture narrow, short: lip thin and smooth within, slightly compressed about its middle portion. Columella arched above; beneath convex, and turned to the left, with a short canal. *Color.* Dark fawn or reddish. Length, 0·75. Width, 0·2.

This is a very rare shell, occurring on both sides of the Atlantic, and first detected by Mr. Couthouy in the stomachs of fishes caught off our coast, as yet its only known locality.

Fusus imbricatus.

PLATE IX. FIG. 188.

Description. Shell elongate, robust. Whorls five; the apicial one smooth, polished, very acute; suture distinct. Whorls with equal equidistant vertical folds, crossed by alternately larger and smaller revolving lines, which are also distinct in the intervening spaces: these lines are most prominent and cancellate on the lower part of the body-whorl. Lip curved inward above, and crenate on the whole margin by the revolving lines; on the beak, these revolving lines become obliquely ascending, or nearly vertical. Canal nearly straight, patulous, broadly emarginate at base.

Color. Ashen grey; columella dark olive; lip yellowish within.

Length, 0·55; of aperture, 0·3.

Obtained by dredging in the harbor of New-York. It has the general configuration of *F. cinereus*, with which it is usually associated: it differs mainly in the form of the aperture, and the development of the revolving lines.

Fusus pyruloides.

PLATE IX. FIG. 191.

Description. Shell solid, ventricose, turreted. Spire pointed, moderately elevated. Whorls seven; the two upper ones smooth: body-whorl with its upper fifth portion vertically depressed, obliquely flattened. The whole surface covered with alternate large and small revolving ribs, undulated by their decussation with smaller vertical raised lines. Upper whorls with a vertical and flattened portion resembling the body-whorl; along the carinated edge of the body-whorl, a series of small tubercles. Aperture oblong-oval, narrowed beneath, ending beneath in a very short canal, and more than two-thirds of the total length. Lip thin, somewhat inflated, rendered waving by about thirty distinct robust revolving ribs within the aperture, which descend obliquely beneath until they become nearly vertical; some of these ribs become duplicated near the outer margin: pillar-lip with an oblique inconspicuous fold. Opercle horny, irregularly subovate.

Color. Epidermis ashen brown; upper portion of the columella bluish, beneath wax-yellow; interior of the aperture, polished umber-brown; ribs near the base of the aperture, white.

Length, 0·95; of aperture, 0·7.

This shell was found attached to the bottom of a vessel in the harbor of New-York, believed to have arrived from a southern port. I have given it a name indicating its resemblance to the genus to which it may possibly belong; a name proposed by its zealous discoverer, Dr. Stillman.

Fusus tornatus.

Fusus tornatus. Gould, Am. Journ. Science, Vol. 33, p. 197.
F. id. Id. Invertebrata of Mass. p. 236, fig. 201.

Description. Shell large, coarse, turreted. Whorls eight, very convex, rather ventricose, with distant elevated revolving ribs; on the upper whorls, two of these, more prominent than the rest, give them a bicarinated appearance. Suture deep. Incremental striæ distinct, but otherwise the shell has a smooth and worn appearance. Aperture rather less than half the length of the shell, broad-oval, and somewhat dilated: lip sharp, and somewhat angulated by the most prominent revolving bands; in adults, the inner margin covered with a callus. Canal short, much recurved.

Color. Soiled white, of faint brownish horn-color; ribs light chesnut-color.

Length, 2·5. Width, 1·25.

This large *Fusus* has hitherto only been obtained from the stomachs of codfishes. Dr. Gould has little doubt but that it is the *M. despectus* of Linneus; but as another shell is now universally received under that name, he thinks it more judicious to give this a new name. If the *F. antiquus* of Pennant is intended by the same shell, no two species can be more different (See *Pennant's British Zoology*, Vol. 4, p. 282, pl. 81). I am unacquainted with the *F. tornatus* of Gould, except through his description and figure, which I have adopted.

Fusus bamfius.

PLATE XXXVI. FIG. 339.

Murex bamfius. Montagu, Test. Brit. Supplement, p. 117.
Fusus id. Gould, Invertebrata of Mass. p. 239, fig. 198.

Description. Shell small: whorls six, rounded; spire elevated; suture deeply defined; from fifteen to twenty sharp vertical folds; aperture rounded, less than half the length of the shell, ending in a curved canal half the length of the aperture; lip sharp, direct or reflected according to age.

Color, light brownish; folds whitish or brownish with age; aperture brown.

Length, 0·5. Width, 0·22.

Found in the stomachs of fishes, and on both shores of the Atlantic. I only know this species through the description and figure given by Dr. Gould.

(*EXTRA-LIMITAL.*)

F. bicolor. (Say, Jour. Ac. Sc. Vol. 5, p. 215.) Shell small, short, fusiform; beak and spire subequal. Whorls 5, convex, with abrupt undulations near the suture, almost rising into arched scales. Surface sculptured with small revolving grooves, of which there are 20 – 30 on the body-whorl: suture deeply impressed; aperture diminishing to the beak. *Color*, lower half of body-whorl tinged with rufous. Length, 0·45; width, 0·25. *Florida.*

F. muricatus. (Gould, Op. cit. p. 293.) Shell slender. Whorls seven, very convex, with about ten conspicuous vertical folds, crossed by coarse elevated revolving lines, making a rough almost tuberculated surface: canal straight, equalling half the length of the shell; outer lip jagged by the revolving lines, sometimes much thickened. *Color*, yellowish white or orange. Length, 0·7; width, 0·3. Stomachs of fishes. *Northern Coast.*

F. turriculus. (Gould, op. cit. 292. Pl. 36, fig. 340 of this work.) Shell small, thin. Whorls seven or eight, angulated and turreted: surface with 12 – 14 prominent folds, and numerous distinct revolving lines; beak open, short and nearly straight. *Color*, white, yellowish or brownish white. Length, 0·66; width, 0·25. Stomachs of fishes.

GENUS PLEUROTOMA. *Lamarck.*

Animal unknown, but probably not differing from that of *Fusus*. *Shell* fusiform or turreted, generally ribbed: aperture oval, terminating in a canal more or less elongated; lip simple, thin, with a notch above. Columella smooth, nearly straight.

Obs. This genus was first identified on our coast by Mr. Couthouy. It contains at present three species, two of which have only been found in the stomachs of fishes.

Pleurotoma bicarinata.

PLATE VI. FIG. 113.

Pleurotoma bicarinata. Couthouy, Journ. Nat. Hist. Vol. 2, p. 104, pl. 1, fig. 11.
P. id. Gould, Invertebrata of Mass. p. 231, fig. 186.

Description. Shell minnte, tapering at both extremities, turreted. Whorls six, convex, with numerous revolving ribs, and smaller ones intervening; about the middle a deep groove, with two prominent revolving ribs on each side: sutures clearly defined. Aperture narrow, elliptical, ending in a short canal slightly inclining to the left: lip thin, toothed by the revolving ribs, with a slight notch above; pillar-lip arched at its upper third.

Color. Whitish or slate-color, or dusky brown.

Length, 0·3. Width, 0·15.

Stomachs of fishes on the northern coast. Very rare.

Pleurotoma decussata.

PLATE XXXVI. FIG. 344.

Pleurotoma decussata. Couthouy, Journ. Nat. Hist. Vol. 2, p. 183, pl. 4, fig. 8.
P. *id.* Gould, Invertebrata of Mass. p. 281, fig. 186.

Description. Shell minute, fusiform, turreted. Whorls five or six, convex, plicate, longitudinally and obliquely crossed by numerous revolving striæ: spire regularly sloping to an acute apex; suture distinct, with a shoulder near it on the whorls; aperture oblong oval, with a short canal at the base; lip acute, with a slight notch above; columella arched, flattened, with its base turned somewhat abruptly to the left. Opercle with concentric elements; its apex below.

Color. Epidermis olive-colored; beneath white, ashen white or flesh-color.

Length, 0·35. Width, 0·15.

Found in the stomachs of fishes on the northern coast. Resembles *Fusus harpularius*, except in the generic distinction. According to Dr. Gould, there is a broad light-colored band in the freshest specimens.

Pleurotoma plicata.

PLATE VI. FIG. 120.

Pleurotoma plicata. Adams, Bost. Jour. Nat. History, Vol. 3, p. 318, pl. 3, fig. 6.
P. *id.* Gould, Invertebrata of Mass. p. 282, fig. 187.

Description. Shell minute, thick, fusiform. Whorls six, convex: body-whorl with about twelve prominent oblique folds, crossed by ten or more revolving threads, rendering the folds somewhat nodulous; suture deeply impressed; whorls above with folds and revolving lines; spire pointed, somewhat turreted. Aperture narrow, less than half the length of the shell: lip arched, thickened by one of the folds; notch above deep, distinct and smooth. Canal short.

Color. Epidermis ashen brown; beneath this, ashen white: lip browish within.

Length, 0·25. Width, 0·12.

This species was detected by Mr. Adams, in the mud of New-Bedford harbor. I am indebted to Mr. I. Cozzens for an imperfect specimen of a minute shell from the harbor of New-York, which I refer to this species.

(*EXTRA-LIMITAL.*)

Genus ROSTELLARIA, *Lam.* *Animal* imperfectly known, but, according to Cuvier, resembling that of *Murex.* *Shell* turreted: spire long, pointed; aperture long and narrow, ending in a straight canal in front, and in a channel running up the spire posteriorly; lip widely dilated, often with one or more processes.

R. occidentalis. (GUERIN, Mag. Zool. 1836, pl. 72. GOULD, Op. cit. p. 298. PL. 8, fig. 177 of this work.) Whorls 8 – 9, convex, with numerous waving vertical folds and regular conspicuous revolving lines: lip expanded, with a blunt process above. *Color:* epidermis thick and dusky; beneath bluish white. Length, 2·25; width, 1·5. Stomachs of fishes, and shores of Maine.

FAMILY CONIDÆ.

ANIMAL *not furnished with a veil, but with a trunk; having the eyes either upon or towards the summits of the tentacles: opercle horny. Marine.* SHELL *variable in form, but always in the shape of a cone, more or less elongated.*

Genus CONUS, *Linn.* *Animal* elongated, much compressed and involuted, with a very distinct head, terminating in a trunk susceptible of great extension: tongue armed with two series of sharp teeth. Foot oval, somewhat lengthened, larger in front, with an anterior transverse furrow. Mantle narrow, and forming an elongated siphon in front. Opercle horny, small, subspiral. *Shell* thick, solid, conical: aperture long, narrow, linear, entire; lip simple, trenchant; pillar-lip smooth.

OBS. These are for the most part inhabitants of the equatorial seas; and of the one hundred and eighty described by Lamarck, none have been found on the coast of the United States, except on the Florida Keys.

C. mus. (LAM. An. sans vert. Vol. 7, p. 457.) Shell ovate, turbinate, coronate, with elevated transverse striæ; spire acute. Ash-colored, banded with white, with longitudinal fulvous blotches. Length, 1·0. *Florida Keys.*

C. leucostrictus, GMEL.

FAMILY MITRIADÆ.

ANIMAL *with conical subulate tentacles, with the eyes on the external side, either near the base or on the middle portion. Marine.* SLELL *oblong, more or less elongated: aperture narrow, and more or less emarginate. Opercle, in one genus, horny.*

Genus TEREBRA, *Brug.* *Animal:* head bordered with a small fringe; tentacles approximated, cylindrical, with the eyes at the outer base; mouth with no trunk; foot oval, with an anterior transverse furrow and two lateral processes; siphon much elongated.

T. dislocata. (Cerithium *id.* Say, Ac. Sc. Vol. 2, p. 235. *T. petitii*, Kiener. Pl. 7, fig. 158 of this work.) Shell small, polished, attenuated. Whorls with numerous minute impressed revolving lines, and 15 – 18 transverse ribs to each whorl, which are dislocated near the summit of each whorl by a revolving line as deep as the suture. *Color*, chocolate-brown; ribs white: a pale revolving band on the body-whorl. Length, 0·8 – 1·3; of aperture, 0·2 – 0·25. *Maryland and the Southern coast.*

Genus Oliva, *Brug.* *Animal* with approximated tentacles, enlarged at base, filiform at their extremities, bearing the eyes on a small enlargement on the middle portion. Foot very large, oblong, and furrowed across in front. Mantle with a single lateral lobe covering a great part of the shell, with two processes on the side of the branchial aperture, and forming a very long siphon in front: a single branchial pecten. Male organ voluminous, on the right side in front: opercle small, horny. *Shell* thick, subcylindric, convolute and smooth: spire short, with canaliculate sutures; aperture longitudinal, emarginate at base; columella obliquely striated or folded.

O literata, Lam. (*O. mutica*, Say, Ac. Sc. Vol. 2, p. 228. *O. literata*, Id. Am. Conch. pl. 3. Pl. 7, fig. 157 of this work.) Numerous brownish or fulvous zigzag marks on the surface, with one or more light-colored obsolete revolving bands; often maculated. Length, 2·5. *Southern Coast.*

Genus Marginella, *Lam.* *Animal* with a small trunk: mouth with a small lingual riband, on which are numerous sharp denticulations; tentacles conical, with the eyes at the outer base on small tubercles; foot elliptical, very large; mantle with a lobe on each side, which may be reflected on the back of the shell, and in front a rather long siphon. *Shell* oblong-ovate, smooth: spire short; outer lip with a marginal longitudinal varix; base slightly notched; columella plicated; folds nearly equal.

M. carnea. (Storer, Bost. Jour. Nat. Hist. Vol. 1, p. 465, pl. 9, fig. 3, 4. Pl. 7, fig. 159 of this work.) Right lip thick, indistinctly denticulated within, and continued in mature shells to the apex, which it partially or entirely covers: aperture narrowed; columella with four folds. *Color*, carneous or flesh-colored, with a transverse whitish band; right lip white. Length, 0·5; width, 0·28. *Key West, Florida.*

FAMILY CRYPTOSTOMIDÆ.

ANIMAL *with the eyes at the external base of the tentacles. Marine.* SHELL *either external or internal, ear-shaped, much depressed, with a very large aperture; in some genera, the shell entirely wanting. No opercle.*

GENUS SIGARETUS. *Lamarck.*

Animal oblong, convex above, plane beneath: mantle very large, emarginate in front; head wide, with two conic tentacles. Gills composed of two pectens. Vent and generative organ on the anterior right side, that of the male being very voluminous. *Shell* internal, much depressed: aperture large; spire small, flattened, lateral; lip thin and trenchant; pillar short and spiral. Two lateral muscular impressions.

SIGARETUS PERSPECTIVUS.

PLATE VII. FIG. 156. A. B.

(STATE COLLECTION.)

Sigaretus perspectivus. SAY, American Conchology, pl. 25. Subsequently *Calyptostoma.*

Description. Shell moderately large, ovate-elongate, depressed. Surface with numerous impressed transverse slightly undulated lines, which are crossed by revolving striæ which become obsolete beneath. Aperture more than three-fourths of the entire area of the shell. Whorls three: spire depressed, smooth, exhibiting the whorls almost to the summit; suture distinct, but not deeply impressed.

Color. Most usually milk-white, sometimes tinged with brown; within smooth and polished, and faintly iridescent.

Length, 0·9 – 1·5; of aperture, 0·7 – 0·9.

This is a southern species, as far as I can learn; not having been as yet found to the north of the coast of this State. It is not unfrequent on the seacoast of Long island, near Rockaway.

(*EXTRA-LIMITAL.*)

S. haliotoideus. (GOULD, Invert. Mass. p. 244, fig. 158. *S. oxinoe,* COUTHOUY.) Shell small, obliquely ovate, pellucid, white, compressed, smooth: aperture very large; whorls two. Length, 0·5: width, 0·4. Stomachs of fishes. *Coast of Massachusetts and Europe.*

S. maculatus. (SAY, Am. Conch. pl. 25.) Shell with numerous transverse hardly undulated impressed lines and longitudinal wrinkles: spire hardly proimnent, slightly convex; whorls about three; suture a simple impressed line. *Color,* whitish, with two bands of pale rufous spots, and a rufous band near the suture: smaller than the preceding. *Southern Coast.*

GENUS VELUTINA. *Blainville.*

Animal scarcely spiral: edge of the mantle simple in front, and double in its circumference; the inner lip being thicker and tentacular. Tentacles large, conic, distant, with a frontal veil between them: eyes sessile at the base. Respiratory cavity large, with no trace of tube, and with two unequal oblique pectens. Orifice of the ovary at the base of the male organ, which lies at the origin of the right tentacle. Muscular impression crescent-shaped. *Shell* small, thin, subglobose, patelliform, composed of two rapidly enlarging volutions: aperture subovate; lip thin, not joined behind. Usually covered with a velvet-like or powdery epidermis.

Velutina lævigata.

PLATE XXIII. FIG. 254.

Helix lævigata. Lin.
Velutina capuloidea. Blainville, Malacol. pl. 42, fig. 4.
V. rupicola. Conrad, Jour. Acad. Nat. Sci. Vol 6, p. 266, pl. 11, fig. 17, 18.
V. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 66.
Galericulum lævigatum. Brown, Conch. pl 38, figs. 35, 36.
V. lævigata. Gould, Invertebrata of Mass. p. 241, fig. 159.

Description. Shell small, oval, very thin and fragile. Whorls three; the body-whorl with faint concentric striæ: spire slightly raised, smooth at the apex. Aperture regularly oval. Epidermis, when not abraded, thick and raised, more conspicuous on the concentric lines.

Color. Epidermis dusky brown, with numerous revolving raised rufous lines; these are slightly irregular and raised, amounting to twenty or twenty-two on the body-whorl: within pearly white. Length, 0·3; of aperture, 0·25.

This is found among seaweed, and in the stomachs of fishes on the northern coast. It occurs on the shores of Europe.

Velutina zonata.

PLATE XXIII. FIG. 253.

Galericulum ovatum? Couthouy, Bost. Jour. Nat. His. Vol. 2, p. 110.
Velutina zonata. Gould, Invertebrata of Mass. p. 242, fig. 160.

Description. Shell small, ovate, moderately thin; spire not raised. Whorls three; the two upper faintly distinct: suture deeply impressed. Surface with a calcareous coating, minutely striated with revolving lines and superficial concentric furrows. Aperture regularly oval: lip expanded, exceedingly thin and fragile; pillar-lip flattened, and with a small superficial fold.

Color. Epidermis whitish or reddish brown, with numerous bands of brown: pillar white.

Length. 0·4. Width, 0·5.

I am not aware that this species, which has been found along the shores of Massachusetts, and obtained from the stomachs of fishes, has been yet detected on the coast of this State.

SECTION 6. SCUTIBRANCHIA.

ANIMAL *with a foot for crawling. Gills arranged either in regular series or detached filaments in a peculiar cavity, which opens in front, either on the back or on the left between the edge of the mantle and the body. Eyes variously placed, sometimes on pedicels. Sexes united, so that they can fecundate themselves. Heart traversed by the rectum, and receives the blood from two auricles, as occurs among most of the bivalves.* SHELL *open, shield-shaped, usually without spire, with a continuous margin.*

FAMILY CALYPTRIADÆ.

ANIMAL *with its eyes on small dilatations, either at or slightly above the external base of the tentacles. Respiratory organs composed of filaments adhering to the sides of the branchial cavity.* SHELL *cup-shaped, not symmetrical: summit rarely spiral.*

GENUS CALYPTREA. *Lamarck.*

Animal with a conspicuous wide head, bifurcate in front, with a marginal band on each side of the neck. Tentacles lateral, distant, very large, triangular, slender at their extremities, with the eyes on a slight dilatation about the middle of their external or posterior margin. Mantle very thin, without lateral tentacles. Foot subcircular, moderate. Branchial cavity very large, oblique from left to right, opening largely in front, and containing a gill formed of long stiff and exsertile filaments. Vent at the extremity of a small tube, floating in the branchial cavity. *Shell* irregular, conoidal: summit vertical, and slightly posterior. Aperture large, circular; an irregularly rounded projecting rim or partition within towards the summit.

CALYPTREA STRIATA.

PLATE VII. FIG. 155. A. B.

Calyptrea striata. SAY, Journ. Acad. Nat. Sciences, Vol. 5, p. 216.

Description. Shell moderately solid, conoidal. Surface with numerous slightly elevated equidistant radiating lines. Summit smooth, obtusely pointed, subspiral, inclining towards the left side and the posterior end; the inner partition cup-shaped, and attached by one side to the shorter side of the shell, acutely angulated at the anterior line of junction, rounded behind, and terminating above near the inner apex of the shell: its margin irregular, not continuous.

Color, greyish; wax-yellow at the summit. Length of base, 0·8. Height, 0·5.

This shell is not common, but has been brought to me from this coast; farther south, it is more abundant.

GENUS CEMORIA. *Leach.*

Shell small, cup-shaped. Apex elevated and curved forward, with a fissure just behind the apex.

Cemoria noachina.

PLATE IX. FIG. 195.

Patella noachina. Lin.
Cemoria flemingii. Leach, Br. Shells, pl. 10, fig. 5.
Rimula noachina. Couthouy, Bost. Journ. Nat. Hist. Vol. 2, p. 87.
C. id. Gould, Invertebrata of Mass. p. 156, fig. 18.

Discription. Shell small, conical. Apex recurved, obliquely perforated; opening within by a smaller aperture, which is covered by an arched scale. Surface covered with about twenty unequal radiating ribs, which feebly crenate the margin of the aperture. *Color*, bluish white.

Length, 0·2. Height, 0·1.

This remarkable little shell, which also occurs on the shores of Europe, has been only obtained from the stomachs of fishes on our coast.

(*EXTRA-LIMITAL.*)

C. alternata? (Fissurella *id.* Say, Ac. Sc. Vol. 2, p. 224.) Shell with equally concentric lines crossed by alternately larger and smaller radii, all of which are not dilated: perforation oblique, oblong; apex with an indented transverse line at the larger end of the perforation. *Color*, cinereous or dusky; within white. Length, 0·8 – 1·5; diameter, 0·6 – 1·0. *Coast of the U. S.*

GENUS CREPIDULA. *Lamarck.*

Animal with its head convex, bordered in front with a bifid lip. Tentacles nearly cylindrical, large, obtuse, little contractile, with the eyes at their external base. Foot moderately thick, Mantle thin, without lateral appendices: branchial cavity very large, oblique from right to left, with a large opening; the gills form a transverse series of long filaments, which are capable of floating externally. Vent on the right in the same cavity. *Shell* oval, arched, cup-shaped, more or less elongated: spire imperfectly formed, and pressed against the margin. Cavity large, with trenchant margins, and partially divided by a horizontal partition.

Crepidula fornicata.

PLATE VII. FIG. 154, ADULT; FIG. 152, YOUNG.

(STATE COLLECTION.)

Patella fornicata.	Lin. Syst. Nat. 1257.
Crepidula id.	Lamarck, An. sans vert. Vol. 6, part 2, p. 42, Ed. prior.
C. *id.*	Say, Jour. Acad. Nat. Sc. Vol. 2, p. 225; Am. Conch. pl. 44.
C. *id.*	Gould, Invertebrata of Mass. p. 158, fig. 17.

Description. Shell varying in convexity, with one side more oblique than the other: apex turned to one side, not separate from the body of the shell; surface transversely wrinkled. Partition or diaphragm smooth, slightly concave, occupying about half the length of the shell, with the margin uniting with the cavity in a solid manner; the free edge subacute, with a waving or sinuous margin.

Color. Epidermis olive-green, tinged with light rufous, and with obsolete longitudinal undulated chesnut-colored lines: within reddish brown, the ends of the rufous lines appearing along the margin.

Length, 1·0 – 2·0. Width, 0·7 – 1·3.

This species is the most common and the largest found on our coast. They are most usually found adhering to each other, and to other shells; when adhering to the Pecten, the margin is observed to have undulations corresponding to the ribs of the Pecten. I have noticed four or five adhering to each other. It occurs from the mouth of the St. Lawrence, and probably further north, to the Gulf of Mexico.

Crepidula plana.

PLATE VII. FIG. 153. A. B.

(STATE COLLECTION.)

Crepidula plana. Say, Jour. Acad. Nat. Sc. Vol. 2, p. 226; Am. Conch. pl. 44.
C. unguiformis? Lamarck, An. sans vert. Vol. 6, part 2, p. 25, Ed. prior.
C. plana. Adams, Bost. Jour. Nat. Hist. Vol. 2, p. 276.
C. id. Gould, Invertebrata of Mass. p. 159, fig. 16.

Description. Shell subovate or obscurely quadrilateral, depressed, very slightly convex, thin, polished, transversely wrinkled. Apex minute, pointed, forming a terminal angle, which in old shells is obsolete. Diaphragm convex, contracted in the middle and at one side, nearly half the length of the shell, rising nearly to a level with the lateral margins of the shell; its free edge sinuous, and, according to Dr. Gould, in entire specimens has a deep notch on one side, and a more superficial one on the other.

Color, white; diaphragm satin-white.

Length, 1·0 – 1·5. Width, 0·7 – 1·0.

This is found on the seacoast of Long island, although more rare and generally much smaller than the preceding. It is parasitic on other shells, usually on the inner surface, where it is sometimes accompanied by the *fornicata*. Hence it has been regarded by some as a mere variety of that species, modified by its peculiar position. The young are more orbicular, and I have seen them strongly ribbed when taken from the *pecten*, as has been elsewhere remarked of *Anomia*. It is possible that a specimen, thus altered by position, may have given rise to the *C. depressa* of Say; but it is proper to add, that I have never seen an authentic specimen of that species. It has a wide but less limited range than the *fornicata*, being found from Massachusetts to the Gulf of Mexico.

Crepidula convexa.

PLATE VII. FIG. 131.

Crepidula convexa. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 227.
C. id. Adams, Bost. Jour. Nat. Hist. Vol. 2, p. 279.
C. id. Gould, Invertebrata of Mass. p. 160, fig. 15.

Description. Shell small, very ovate, convex, descending almost abruptly on one side, more gradually sloping on the other. Apex acute, separate from the body of the shell, and turning down nearly to the plane of the aperture and occasionally beyond it. Aperture oval-elongate. Diaphragm convex, less than half the length of the shell, deeply placed; its edge waved or sinuous. Outer surface obsoletely wrinkled.

Color. Ashen brown, with spots or stripes of a dark reddish brown; within dark chesnut; the diaphragm lighter brown and bluish; the edge white.

Length, 0·2. Width, 0.1.

This small species is found attached to seaweed or to stones; it is not so common as the preceding. It occasionally reaches the length of half an inch, but I have never seen it of this size on our coast.

Crepidula glauca.

Crepidula glauca. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 226.
C. *id.* Gould, Invertebrata of Mass. p. 161, fig. 14.

Description. Shell moderately small and convex, broadly oval, thin, nearly smooth, with minute transverse wrinkles. Apex conic, pointed, projecting, somewhat beyond the surface, and nearly to the plane of the aperture. Diaphragm less than half the length of the shell, with an irregular surface, partly convex and concave, deeply seated, and with a small cavity under the apex: edge of the diaphragm curved.

Color. Greenish grey, maculated within dusky; within uniform chocolate-brown: diaphragm yellowish white or opake white.

Length, 0·5. Width, 0·28.

This species is said to occur on our coast, but my specimen was from Rhode-Island.

(*EXTRA-LIMITAL.*)

C. depressa. (Say, Ac. Sc. Vol. 2, p. 225.) Much depressed, nearly equilateral, transversely wrinkled: apex not curved, forming a simple acute terminal angle upon the margin of the aperture, which is subovate. Diaphragm convex; edge contracted in the middle and at one side. *Color:* epidermis pale yellowish brown; within white. Length, 0·8. *Southern Coast.*

C. intorta? (Id. Ib. Vol. 2, p. 227.) Convex-ovate, with about 20 elevated somewhat undulated lines with alternate smaller ones, somewhat confused on the convex side, the larger ones with a few slightly elevated very thick tubercles: apex curving laterally; tip pointing upwards, and not elevated from the body of the shell. *Southern Coast.*

SECTION 7. CIRROBRANCHIA.

ANIMAL *with its foot anterior and terminal, elongated into a conical shape, in order to penetrate sand. Gills in the form of numerous long filaments, arising from two radical lobes above the neck, and enveloped by the mantle, which opens in front: a few tentacular expansions. Eyes* ——. *Sexes united.* SHELL *simple, symmetrical, tubular.*

FAMILY DENTALIDÆ.

With the characters of the section. Only one family as yet observed.

GENUS DENTALIUM. *Linneus.*

Animal with small oval distinct head. Mouth terminal, surrounded by digitated labial processes, furnished with a pair of lateral oval jaws bristled with points. The cylindrical mantle enveloping nearly the anterior half, terminating in front in a sort of collar, through which is apparent the circular opening of the foot. Foot ending in front in a sort of cup, in the centre of which is a conical appendix. Gills disposed in long filaments, arranged in two groups on each side of the upper part of the neck. Vent median, at the posterior extremity. Generative organs unknown. *Shell* tubular, elongated, conical, not spiral, very slightly curved, open at both ends.

OBS. Nearly fifty fossil and recent species of this genus are noticed in the most recent systematic works, of which one fossil species only is noticed from the United States. In the most recent edition of Lamarck's *Animaux sans vertèbres*, the animals of this genus are still arranged among the *Annelides*. But one recent species has been observed on our coast.

DENTALIUM DENTALIS.

PLATE X. FIG 197.

Dentalium dentalis. LIN. Syst. Nat. 1263.
D. *id.* GOULD, Invertebrata of Mass. p. 156, fig. 5. excl. syn.

Description. "Shell slender and tapering, shaped like an elephant's tusk; the tip cut off, leaving a very small opening. Surface rather glossy, yellowish white, marked with about twenty closely arranged unequal rib-like striæ, running the whole length of the shell. Length about an inch; diameter at the larger end about one-eighth of an inch."

Two specimens of this shell, according to Dr. Gould, whose description I have copied, were obtained from the stomachs of codfish on the coast of Massachusetts.

(*EXTRA-LIMITAL.*)

D. attenuatum. (SAY, Journ. Acad. Vol. 4, p. 154, pl. 8, fig. 3.) Shell arcuated: surface with from 12 – 16 rounded ribs, the intervening grooves simple; lines of growth numerous, distinct; aperture orbicular. Length- 1·7. Fossil. *Maryland.*

NOTE. The size and fewer longitudinal ribs, with its fossil condition, induce me to consider it as distinct from the preceding.

SECTION 8. CYCLOBRANCHIA.

ANIMAL *furnished with a foot for crawling. Gills in the form of lamellæ, in a series more or less complete, in the furrow between the mantle and body; or a small gill on the right side of the head. Sexes united.* SHELL *not spiral, covering the soft parts, and of one or many pieces.*

NOTE. I have retained the name of this section, although it is not significant in its present extended meaning.

FAMILY PATELLIDÆ.

ANIMAL *furnished with tentacles, and eyes at their external base. Gills forming a series of lamellæ around the body or on the side of the neck.* SHELL *univalve, cup-shaped.*

GENUS PATELLA. *Linnæus.*

Animal with a very distinct head, terminated in a thick and short trunk. Vent on the neck, back of the head. Mouth fleshy with a long prickly tongue, which folds itself in the visceral cavity. Duct of the ovary near the right tentacle. Gills arranged round the body in a series of lamellæ. *Shell* conical, cup-shaped, solid: apex nearly central.

PATELLA CANDIDA.

Patella candida. COUTHOUY, Bost. Jour. Nat. Hist. Vol. 2, p. 86, pl. 3, fig. 17.
P. id. GOULD, Invertebrata of Mass. p. 152.

Description. Shell small, conical, with numerous minute revolving ribs, traversed by equally fine concentric lines, giving the surface under the lens the appearance of net-work. Summit nearly central: margin slightly scolloped by the termination of the ribs. *Color,* white.

Length, 0·35. Height, 0·1.

Stomachs of fishes. Coast of Massachusetts. First noticed by Mr. Couthouy; but three specimens found.

GENUS PATELLOIDA. *Quoy and Gaymard.*

Animal with gills composed of subtriangular lamellæ, which arise from the bottom of a cavity on the back of the neck, and project out on the right side of the neck. *Shell* shaped like the preceding, but usually smaller, more thin, depressed and diaphanous.

PATELLOIDA TESTUDINALIS.

PLATE IX. FIG. 196.

Patella	*testudinalis.*	MULLER, Zooligia Danica Prod. p. 237.
Patella	*amœna.*	SAY, Journ. Acad. Nat. Sc. Vol. 2. p. 223.
Patelloida	*amœna.*	COUTHOUY, Bost. Journ. Nat. Hist. Vol. 2, p. 171.
P.	*testudinalis.*	LEA, Tr. Am. Phil. Soc. Vol. 7, p. 73.
Lottia	*id.*	GOULD, Invertebrata of Mass. p. 153, fig. 12.

Description. Shell oblong-oval, frequently with a calcareous deposit, under which we observe numerous radiating lines, which are crossed by minute concentric wrinkles. Margin entire, acute: apex behind the middle, and turning towards the short end.

Color. Whitish or greenish white, with brownish radiating stripes crossed by lines of the same; occasionally uniform greenish or brownish. Within a large piceous brown spot under the apex, with an outer concentric line, from which proceed short radiations to the margin.

Length, 0·8 – 1·5. Width, 0·5 – 0·8.

This shell, which is found along our northern coast, is now determined to be identical with the *P. testudinalis* of Europe. I follow Couthouy rather than Gould in adopting *Patelloida*, although it is not unobjectionable on the score of its derivation. I can scarcely understand by what right of priority the name of *Lottia* should be retained, when the very groundwork of the group was first displayed by Messrs. Quoy and Gaymard, and the characters of *Lottia* were by its author confined to the shell alone.

PATELLOIDA ALVEUS.

PLATE IX. FIG. 194.

Patella	*alveus.*	CONRAD, Jour. Acad. Nat. Sciences, Vol. 6, p. 267, pl. 2, fig. 20.
Patelloidea	*id.*	COUTHOUY, Bost. Journ. Nat. Hist. Vol. 2, p. 177.
Lottia	*id.*	GOULD, Invertebrata of Mass. p. 154, fig. 13.

Description. Shell oblong, sublinear, elevated, thin, pellucid, with fine radiating striæ, and fine concentric lines: sides nearly straight; apex not central, pointing to the short end.

Color. Whitish, with reddish brown spots and lines, which are visible within: a pitchy brown central spot within.

Length, 0·3 – 0·5. Width, 0·2 – 0·3.

Mr. Couthouy, to whom we are indebted for our first anatomical acquaintance with this animal, observes, that "perhaps it would be more correct to consider it as a constant variety (of *P. testudinalis*), than as a distinct species;" and "many species have been received as valid, upon far narrower distinctions than exist between this and Mr. Say's shell." It occurs almost universally upon the *Eel-grass* (*Zostera marina*), while the *testudinalis* is attached to rocks.

FAMILY CHITONIDÆ.

ANIMAL *without tentacles or eyes, but furnished with a small veil. The branchial apparatus formed by a cordon of small pyramidal leaves, around the mantle.* SHELL *multivalve, shield-shaped.*

GENUS CHITON. *Linnæus. Lamarck.*

Animal elongate, obtuse at both ends, and without a very distinct head. Tentacles replaced by a small membranous veil, which extends over the mouth; the latter inferior, without jaws, and with a small prickly tongue. Foot elongated, the mantle extending beyond it more or less completely; the gills under the edge of the mantle, particularly behind. Vent at the posterior extremity. Generative organs double; one on each side, between the leaves of the gills. *Shell* oval, composed of eight arched pieces arranged in a series more or less overlapping each other, their sides imbedded in the skin.

CHITON ALBUS.

PLATE X. FIG. 200.

Chiton albus. MONTAGU, Test. Brit. 4.
C. sagrinatus. COUTHOUY, Bost. Journ. Nat. History, Vol. 2, p. 82.
C. albus. GOULD, Invertebrata of Massachusetts, p. 150, fig. 21.

Description. Shell small: valves with a small beak, minutely crenulate on their anterior margin, subcarinate with minute striæ; the surface, under the lens, exhibiting the appearance of shagreen. An obsolete diagonal ridge sometimes divides each side into triangular areas, but for the most part without any distinct boundary. Margin membranous, covered with beaded granules.

Color. Epidermis a blackish powder, underneath which greyish white; the marginal membrane ash-colored, with a narrow black line in the middle surrounding it.

Length, 0·4. Width, 0·15.

This species was originally discovered by Mr. Couthouy in the stomachs of fishes off the coast of Massachusetts, and described by him under the appropriate name of *sagrinatus*. It has since been referred to the *albus* of Montagu, and *aselloides* of Lowe, by Dr. Gould.

I refer to this species, a *Chiton* found in the harbor of New-York, attached to the ovaries of *F. canaliculatus*, and kindly placed at my disposal by Dr. Budd. It has a conspicuous series of holes on each side, between each valve, near their lateral margins; the lateral membrane appears to have been bordered with white. In other respects it agrees with the description given above.

Chiton apiculatus.

PLATE X. FIG. 201 and 202.

Chiton apiculatus. Say, American Conchology, No. 8, fide Gould.
C. pectinatus, Gould. *C. apiculatus*, Id. Invertebrata of Mass. p. 146, fig. 20.

Description. Shell oblong-oval, convex: valves obtusely carinate, the central portion of the posterior margins becoming slightly beaked with age. Lateral areas triangular, studded with numerous rounded tubercles, disposed in no regular order, obsolete towards the apices, more numerous towards the lateral margins, which are rounded with an elevated marginal line. Medial areas lozenge-shaped, with numerous elevated rounded dots arranged in ten or twelve series on each side of the carina, parallel with the longitudinal axis of the body. In aged individuals, the lateral margins of the valves have the tubercles arranged in concentric lines; terminal valves with concentric dotted lines; margin membranaceous, obscurely granulate.

Color, variable; when freshly captured, greyish, inclining to ashen: in cabinets, they often appear bluish or ferruginous.

Length, 0·5 – 1·0. Width, 0·3 – 0·6.

I had indicated this species as *C. jayi*, when Dr. Jay obligingly favored me with specimens precisely similar, labelled "*pectinatus*, Gould." I therefore adopted the name, although I had not met with the description. More recently, the publication of the manuscripts of Mr. Jay has made us acquainted with the fact that he had described this species under the name which it bears at present.

It is rather a common species, and is frequently found adhering to oysters. Like their congeners, they are parasitic, and, when detached, are capable of moving with considerable rapidity through the water. It has a wide range, having been found from South-Carolina nearly to Cape Cod in Massachusetts.

(*EXTRA-LIMITAL.*)

C. marginatus, Pennant. (Gould, Op. cit. 147, fig. 22.) Shell small, ovate, carinate and pointed behind: surface apparently smooth, but, under the lens, minutely shagreened in diamond-shaped granules. *Color*, dull ashen or greenish. Length, 0·5; width, 0·3. Very rare. *Seacoast of Massachusetts.*

C. fulminatus. (Couthouy, Bost. Journ. Vol. 2, p. 80, pl. 3, fig. 19. Pl. 10, fig. 199 of this work.) Shell ovate-oblong, rather flat; the valves carinate and slightly beaked, covered with microscropic granulations arranged in quincunx: margin pubescent. *Color*, brownish or yellowish red, with white points along the posterior margins of the valves. Length, 0·7; width, 0·45. Stomachs of fishes. *Mass.*

C. ruber, Lowe. (Gould, Op. cit. fig. 24.) Shell small, oval, elevated, carinated: surface smooth under the lens, except the lines of growth; valves strongly beaked. *Color*, light brick red or flesh-color under a blackish pigment; interior bright rose red. Allied to *fulminatus*, but distinguished by its unpunctured surface. Found in fishes, and attached to stones in deep water. *Massachusetts.*

C. emersonii. (Couthouy, Bost. Jour. Vol. 2, p. 83, pl. 3, fig. 10. Pl. 10, fig. 198 of this work.) Shell ovate-oblong, broadest behind: valves reniform, each with a central heart-shaped area, with bead-like granules or tubercles in concentric series round the margin, the remainder covered with a soiled downy membrane; marginal membrane with series of yellow hairy tufts. *Color*, whitish. Length, 0·8; width, 0·5. Allied to *C. vestitus*, Sowerby. Stomachs of fishes taken in Massachusetts bay.

ORDER IV. ACEPHALA.

Body fixed or free. No distinct head, but a mouth without teeth, concealed in the bottom or between the folds of the mantle, often furnished on each side with a pair of appendices. Eyes none. The gills usually consist of four large laminæ, or leaflets, with a vascular network. Sexes united in the same individual. Aquatic. The shell external, and mostly composed of two valves, or wanting, but in that case furnished with a thick mantle.

Obs. The animals of this order are divided by Cuvier into two sections: the first, which is most numerous, contains all the bivalve and some of the multivalve shells; the other, *Acephala nuda*, comprises those in which the shell is replaced by a cartilaginous membrane. We shall consider his class *Brachiopoda* as a section of the *Acephala*, with which they have many characters in common; although the position of the animal in its shell, with its back against the hinge, differs from other bivalves.

SECTION 1. BRACHIOPODA.

Animal *enveloped in a bilobed mantle, which is always open. Mouth anterior, and furnished with a pair of fleshy arms with curled filaments at their edges, and capable of being extended externally. The gills applied to the internal surface of the lobes of the mantle. Vent anterior. Organs of generation unknown.* Shell *bivalve, united behind either with or without a hinge, opening in front.*

FAMILY TEREBRATULIDÆ.

Animal *more or less globular or flattened, with the montle open in front and towards the side.* Shell *inequivalve, equilateral, with a hinge, and adhering to other bodies either directly or by means of a tendinous cord.*

EXTRA-LIMITAL.

Genus Terebratula, *Bruguieres.* *Animal* with the gills arranged in a pectinated form on the inner surface of the mantle; the long arms rolled into a spiral form when at rest. *Shell* variable in its form, often ribbed: one valve prolonged into a recurved beak, and perforated at its tip, for the passage of a ligament, by which it attaches itself to foreign bodies; two bony processes on the interior of the smaller valve.

T. caput-serpentis, Linn., Gould. (*T. septentrionalis*, Couthouy, Bost. Journ. Vol. 2, p. 65. Pl. 34, fig. 321 of this work.) Shell rather thin, semitransparent, ovate: upper valve truncated horizontally at the apex; foramen large, one side completed by the apex of the lower valve; surface with a downy epidermis, under which minute radiating striæ. From under each tooth in the lower valve arises a thin process, curving a little inwards, whose extremities support an oval partially twisted ring: margin of the shell crenate. *Color*, whitish. Length, 0·4; Width, 0·2. *Coast of Northern Europe, Maine and Massachusetts.*

T. psittacea, Gmel. (Gould, Op. cit. p. 142, fig. 91. Pl. 34, fig. 322 of this work.) Shell thin and fragile, subtriangular, narrowed above; the beak produced into a decurved horn: surface striated concentrically and in radii; foramen triangular. *Color*, brownish black or sea-green. Length, 0·35; width, 0·25. *Northern Europe, and Seacoast of Massacusetts.*

T. thalassina, Gould.

SECTION 2. LAMELLIBRANCHIA.

Animal *adherent, enveloped in a bilobed mantle, varying in the number and dimensions of its apertures. Mouth transverse, medial, concealed at the bottom of the mantle between two pair of appendices. Gills in the form of semicircular leaves, composed of two pair, one on each side of the body: vent posterior and medial.* Shell *composed of two valves connected by a hinge and ligament, and enclosing the animal.*

FAMILY OSTRACIDÆ.

Animal *with the mantle not adherent, entirely open except on the dorsal part, without tube or peculiar opening. Foot wanting or rudimentary. The two pair of gills united in a medial line.* Shell *inequivalve, inequilateral, irregular, more or less lamellar or foliated: hinge variable; ligament internal or partly internal; muscular impression single, subcentral.*

GENUS ANOMIA. *Bruguières.*

Animal with the edges of its mantle thin, and furnished with a series of tentacular filaments. Foot rudimentary; the adductor muscle divided into three branches, the largest of which passes through an aperture in the lower valve, with a corneous opercle to attach itself to other bodies. *Shell* thin, often translucent: one valve convex; the other flattened or concave, and perforated near the beak. Ligament of the hinge short and thick; muscular impression tripartite.

Anomia ephippium.

PLATE XII. FIG. 209.

(STATE COLLECTION.)

Anomia ephippium. Lin. Syst. Nat. p. 1150.
A. id. et *patellaris.* Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 102.
A. ephippium. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 62.
A. id. Gould, Invertebrata of Mass. p. 138.

Description. Shell orbicular, sometimes transversely elongated and variously distorted, sometimes with undulated or jagged margins. Surface scaly, lamellar, and easily impressed by contact with foreign substances. Upper valve very convex, cup-shaped, with a small beak: lower valve smaller, flat or concave, with a circular hole which is united to the margin by a greater or less fissure.

Color, varying from brilliant yellow to rose-red and white; muscular impression opake white.

Length, 0·5 – 1·5. Width, 0·8 – 1·9.

There is a variety which is ribbed or fluted by contact with a *Pecten*, described as *patellaris*. These flutings are not always longitudinal, but occasionally transverse and even reversed, becoming wider towards the beaks, showing the accidental position of the *Anomia* upon the *Pecten*. Very often both valves are thus ribbed. It is a common species on all our shores, and known under the popular name of *Jingle shells*. Common to the shores of Europe and America.

(*EXTRA-LIMITAL.*)

A. aculeata, Gmel. (Gould, Op. cit. p. 139, fig. 90. Pl. 12, fig. 210 of this work.) Shell small, rounded, inclining to be straight at the hinge-margin. Beaks obtuse, terminal: upper valve with fine prickly scales arranged in radiating lines; lower valve smooth. *Color*, yellowish white. Diameter, 0·5. *Europe, and shores of Massachusetts.*

Obs. Dr. Gould states that probably two other species (*electrica* and *squamula*, Lin.) exist on the coast of Massachusetts.

GENUS OSTREA. *Linnæus. Lamarck.*

Animal with the edges of its mantle thick, not adhering, retractile, with numerous short and irregularly disposed tentacular appendages. Mouth large, funnel-shaped, furnished with two pair of elongated lanceolate appendices. Gills formed by four nearly equal and semicircular leaflets, minutely striated. Vent posterior, with its orifice floating between the lobes of the mantle. *Shell* very irregular, more or less coarsely foliated; left valve generally larger and more concave, adherent; the right valve smaller, usually flattened, often operculiform, moving forwards with age, leaving a groove for the ligament exposed along the adhering valve. Hinge without teeth.

OSTREA BOREALIS.

PLATE X. FIG. 204, ADULT; 203, YOUNG VARIETY.

Ostrea borealis. LAMARCK, Am. sans vert. Ed. Brux. Vol. 3, p. 82.
O. id. GOULD, Invertebrata of Mass. p. 137.

Description. Shell variously shaped, but most frequently suborbicular or oblong-ovate, with loosely imbricated concentric flakes, becoming obsolete towards the beaks, which are usually curved, generally short, but occasionally somewhat elongated. Lower valve concave, with coarse rugose folds on the margin; but these are often indistinct. The young under two years often strongly costate, with six to eight convex ribs or folds, which extend into processes on the margin of the valves, and resembling *equestris* of Say (See pl. 10, fig. 203). Upper valve with a transverse ridge in the hinge, abrupt behind, and sloping gradually into the shell; on the larger valve, this ridge is prolonged backwards.

Color. Dusky brown, intermixed with green; within pearly white: muscular impression purplish. The young, under a year, are reddish, with dusky radiations.

Length, 5·0 – 12·0. Width, 3·0 – 6·0.

More than eighty species of oysters are mentioned in the most recent systematic catalogues; but many of these are so nearly allied, as to render it very doubtful whether mere varieties have not been described as species. Lamarck attributes three species to the coast of the United States; but we must confess our inability to find more than one, and that one, under certain forms, cannot be distinguished from the *O. edulis*, or *Common Oyster* of Europe. The three American species in Lamarck are thus characterized:

1. *O. borealis.* Shell oblong-ovate, whitish, with imbricated undulated plates; upper valve somewhat convex. Length, nearly three inches. Allied to *edulis* and *virginica*, but distinct from both. *New-York.*
2. *O. virginica.* Shell elongate, whitish, narrow, rather straight, thick-lamellar; upper valve rather plane. As it advances in age, it becomes very thick, and its lower beak becomes very long, and with a channel within furrowed transversely: its upper beak tuberous within. Length, six inches. *Virginia.*

3. *O. canadensis.* Shell elongated, subcurved, broad above, very thick and lamellar; upper valve convex. Although closely allied to the preceding, it appears to be constantly distinct. It is larger, wider, of excessive thickness, and its lower beak does not appear to be so much elongated. Length, about eight inches. *Sea of Canada, at the mouth of the Gulf of St. Lawrence; and also near New-York.*

Dr. Gould attributes to the *virginica* (or, as he calls it, *virginiana*, after Lister) the additional character of the ligamentary eminence of the upper valve, extending back to the apex; and thinks that *canadensis* may be a variety of this, or of *borealis*.

This, according to Dr. Gould, is the common oyster of the Chesapeake, and also found on the coast of Massachusetts and at the mouth of the St. Lawrence. The dealers in oysters know of only two principal varieties, the northern and southern; or as they distinguish them, the *Chesapeake* and *York-bay*. They distinguish the latter (*borealis*) by its broader and less ponderous and massy shell; its lips are more frequently upturned, and always thinner and more brittle. They pretend to be able also to distinguish them by the smell alone; the shell of the northern oyster having quite a strong smell, savoring of the odor of the marine plants.

The period of longevity in the oyster is not ascertained, but most dealers agree that it is in its best condition from the fourth to the sixth year. It rarely lives beyond its twelfth or fifteenth year, although they think it probable that a few pass that period. At the end of six months the young oyster is found attached to stones along the shore, of a reddish tint, with radiating striæ, and about the size of a quarter of a dollar; and at the end of the year, as large as a dollar, although this increase depends upon locality. A smooth gravelly bottom, with about a quarter of an inch depth of fine ooze, is generally preferred: if the deposit is deeper, they become excessively elongated and slender, with the margins of the valves drawn out into thin plates, and the oyster has a disagreeable muddy flavor. With age, the strong folds disappear, and by the fifth or sixth year are only seen on the margin; at a later period they are almost entirely effaced, and the species cannot be distinguished from the *virginica*, more especially when these latter have been planted for some time in the New-York waters.

The oyster appears to thrive best, and attain its most luscious flavor on our coast, between the thirty-sixth and forty-second parallels of latitude; and is supposed, by those who have had opportunities of comparison, to be the best in the world. The consumption is almost incredible. Independent of those actually consumed, thousands of tons of the young are annually exported to the eastern ports for the purpose of planting, and an equal number introduced from the Chesapeake for the same purpose.

Beside man, the oyster has many enemies; and were it not for their wonderful fecundity, they would, ere this, have been extirpated. They are taken with oyster rakes or tongs; and where the water is too deep for these instruments, a strong iron dredge or drag is employed. The *Star-fish* (*Uraster rubens*, Forbes) is frequently found clasping the valves of the oyster in such a manner as to prevent their opening, and, as the oystermen assert, the oyster perishes from suffocation, the valves open, and he is devoured by the starfish. Numerous minute

punctures are often seen through the shell, produced by various marine animals; the most common and destructive of these, according to the oystermen, is the *Drill*, or *Fusus cinereus*. I have examined several oysters on which were numerous drills; and upon detaching them, observed, in the centre of a circular abraded spot, a minute puncture not larger than a pin-hole, extending into the body of the shell, but not perforating it entirely through; occasionally these punctures would be very numerous, and apparently communicate with each other, the whole interior being eroded, and the shell itself rotten and brittle. In such cases, the oyster itself would be poor and destitute of flavor, and, as might naturally be inferred, perishes sooner or later. I am informed that when these drills abound in an oyster bed, a great mortality among the oysters is observed.

(*EXTRA-LIMITAL.*)

O. semicylindrica. Say, Ac. Sc. Vol. 2, p. 228.) Shell elongated, semicylindrical: sides parallel; base and tip rounded, equally obtuse; inferior valve very convex; upper valve flat. Muscular impression large, white. *Color*, white, with a fuscous epidermis. Length, 0·35. Attached to *Sponges*. *Georgia, Florida.*

O. equestris. (Id. Am. Conch. pl. 58.) Small, ovate-triangular, with transverse wrinkles, and more or less deeply and angularly folded longitudinally. Lateral margin near the hinge, with 6 – 12 denticulations of the superior valve, received into corresponding cavities of the lower valve: upper valve depressed, but slightly folded. Lower valve convex, attached by a portion of its surface, the margins elevated; folds unequal, much more profound than those of the upper valve. Hinge very narrow, and curved laterally and abruptly. *South Carolina, Florida.*

FAMILY PECTINIDÆ.

Animal *with a mantle, not adherent, open almost entirely in its whole circumference; without tube or peculiar opening; always with the rudiment of a foot at the abdominal portion (often canaliculated), which separates the two pair of gills.* Shell *in general subregular, compact, with ribs or striæ diverging from the beaks, which are often eared. Hinge variable, fixed either by a byssus or by one of the valves.*

GENUS PECTEN. *Bruguières. Turton.*

Animal orbicular, often thick and occasionally much compressed. Mantle margined with one or two series of very fine filaments, among which are seen small pearly globules. Foot small, conic, canaliculate, and generally with a byssus. Mouth surrounded by tentacular appendages, branched and irregular, with a pair of triangular palpi on each side, truncated at their extremities. Gills moderately large: termination of the intestinal canal somewhat beneath. Marine. *Shell* free or fixed, often thin, somewhat orbicular, inequivalve, transversely dilated into auricles: superior margin straight: beaks contiguous. Hinge toothless, with a triangular internal pit for the cartilage; a ligamentous membrane along the whole length of the hinge.

Obs. This genus is remarkable for the beautiful disposition of its colors in many of the species. More than sixty living, and nearly as many fossil species, are enumerated in the most recent publications. Several are used as food.

Pecten concentricus.

PLATE XI. FIG. 205.

(STATE COLLECTION.)

Pecten concentricus.	Say, Jour. Acad. Nat. Sc. Vol. 2, p. 259.
P. *id*	Conrad, Amer. Marine Conchol. pl. 1, fig. 2.
P. *id.*	Gould, Invertebrata of Mass. p. 134, fig. 83.
P. *lineolaris?*	Lamarck, An. sans vert. Ed. Brux. Vol. 3, p. 52. (Young?)

Description. Shell robust, suborbicular, with eighteen to twenty elevated rounded ribs, and numerous concentric wrinkles equally on the ribs and interspaces: no longitudinal lines; one valve somewhat ventricose, the other convex. Auricles nearly equal, nearly straight on one end, rounded or irregular on the other; its surface with obsolete radiating lines. Ligamentary pit superficial, small.

Color. Dusky horn-color, with white or yellowish or reddish concentric bands, most numerous towards the beaks. In the young, one valve is pale yellow, banded with reddish, brown or black; the other brown or grey brown, occasionally brownish black.

Length, 0·8 – 3·1. Width, 0·9 – 3·5.

This is one of the most common shells on the coast of New-York, where it is known under the popular name of *Scollop*, or *Scallop-shell*. It abounds on shallow sandy bottoms, and is taken in great quantities for food, the broad and stout muscular portion being the only part of the animal used. This is boiled and put in vinegar, and considered by many as a great delicacy. The shells, which vary very much in the beauty and delicacy of their coloring, are used for ornamental purposes, such as card-racks, pin-cushions, etc. On a clear calm day, these animals may be seen skipping along to considerable distances on the surface of the water: this movement is accompanied by sharp and quickly repeated sounds, occasioned by the rapid opening and shutting of the valves. I have never noticed these movements in adults. They are preyed upon by numerous fishes.

Pecten islandicus.

PLATE XI. FIG. 206.

Ostrea islandica. Muller, Zool. Dan. prodr. No. 2990.
Pecten pealii. Conrad, Amer. Marine Conchology, p. 12, pl. 2, fig. 2.
P. islandicus. Say, Amer. Conchology, plate 56, fig. 1.
P. id. Gould, Invertebrata of Massachusetts, p. 133, fig. 89.

Description. Shell occasionally very large, sub-rounded; the valves nearly equal. Surface covered with numerous scaly radiating lines, alternately smaller. Ears unequal, with radiating ribs. Five to six minute teeth in the angle beneath the emarginate ear. Margin jagged by the produced elevated radiating lines; intervals between these lines reticulated.

Color. Reddish or orange, with darker concentric bands and pale broad radiations. Ears with dark red concentric lines.

Length, 2·0 – 3·0. Width, 1·9 – 3·0.

I am not aware that this shell has yet been found on our coast, but it has been obtained from the stomachs of fishes. The banks of Newfoundland appear to be its proper locality on the American coast, and it extends very far north. Conrad observed it on the coast of Maine.

Pecten magellanicus.

PLATE XI. FIG. 207. A. B.

Ostrea magellanica. Gmelin, p. 3317.
Pecten id. Conrad, Amer. Marine Conchology, pl. 1, fig. 1.
P. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 62.
P. id. Gould, Invertebrata of Mass. p. 132.

Description. Shell large, orbicular, moderately solid, much compressed; the upper valve more convex, the lower nearly flat. Ears subequal; on the upper valve equal: valves gaping

on both sides near the hinge. Surface with numerous imbricated striæ radiating from the beaks, with a few distant concentric striæ, which, in old age, become deep sinuous furrows, the radiating striæ becoming obsolete. Beaks small, distinct, contiguous. Hinge-margin straight: ligament inserted into a sublinear pit, black, greyish on the sides nearest the base of the pit; within smooth, polished. Muscular impression distinct.

Color. Convex valve pale reddish (on the beaks reddish brown), with pale radiating lines and deeper red concentric circles; lower valve yellowish or tinged with reddish; within polished white.

Length, 4·0 – 5·0. Width, 4·5 – 5·5.

The plate represents the upper valve of a moderate sized shell: the old shells are frequently eroded and pierced by other marine animals. Specimens have been taken by dredging in deep water off Sandyhook, where it appears to be not uncommon, as many were taken at the same time. I have also obtained them in fifteen fathom water, on the south coast of Long island: the convex valves were all more or less deeply sculptured and eroded by marine parasites. They are represented to be palatable as food.

(*EXTRA-LIMITAL.*)

P. purpuratus, Lam. (*P. dislocatus*, Say, Ac. Sc. Vol. 2, p. 260; Am. Conch. pl. 56, fig. 2. Conrad, Am. Mar. Conch. p. 10, pl. 2, fig. 2.) Shell suborbicular, with 20 – 22 elevated rounded ribs and numerous concentric wrinkles: no longitudinal striæ; ears subequal; hinge margin straight in each valve. *Color*, whitish tinged with yellow or reddish, with a few narrow transverse interrupted and dislocated reddish undulated lines, and 5 – 6 obscure spots on the margin at the base of the ears. Length, 1·5 – 2·0; width, 1·6 – 2·2. *Southern coast.*

P. ornatus, Lam. (Conrad, Mar. Conch. pl. 2, fig. 3.) Shell small, somewhat longer than broad, subequivalve, compressed: ribs 30 – 36, alternately smaller and subscabrous; one of the ears very small. *Color*, pale yellowish, with red angular spots. Length, 1·5: width, 1·3. *Florida.*

P. nodosus, Lam. (Conrad, ib. pl. 2, fig. 2.) Shell with nine thick rounded ribs, and strong radiating striæ; ribs with large hollow vesicles. *Color*, reddish brown, orange or white. Length and breadth, 2·0 – 5·0. *Florida.*

P. varius. (Turton, Conch. Ins. Brit. p. 214.) Shell oblong, nearly equivalve, with from twenty-five to thirty compressed ribs more or less clothed with concave spines. *Color*, exceedingly variable, Length, 2·0. Found by Mr. Lesueur on the northern coast.

Genus Plicatula, *Lam.* *Animal* unknown. *Shell* inequivalve, without ears, attenuated at the base; upper margin plaited, rounded; beaks unequal, and without external facet. Hinge with two strong striated teeth on each valve; a pit between the two teeth for the ligament, which is entirely interior.

P. ramosa. (Lam. An. sans vert. Vol. 3, p. 6.) Shell oblong-triangular, very stout and solid, with numerous large ramified folds. *Color*, white, spotted with ferruginous marks. Length, 35 – 40 millimetres.

Genus LIMA, *Brug.* *Animal* with numerous tentacular filaments in many series along the edges of its mantle: foot very small, and carrying a byssus; mouth surrounded by a very thick and fringed labial appendage. *Shell* longitudinal, subequivalve, eared, slightly gaping on one side between the valves: beaks distant; internal face inclined outwards. Hinge toothless: pit partly exterior, receiving the ligament; muscular impression central and trifid.

L. squamosa, Lam. (CONRAD, Mar. Conch. pl. 3, fig. 2.) Shell oblong, with broad and strong scaly ribs: hinge oblique; margin plicate. *Color*, whitish or yellowish. Length, 1·0 – 2·5; width, 0·8 – 1·2. *Florida.*

L. glacialis, Lam. (CONRAD, Ib. pl. 3, fig. 1. PL. 11, fig. 208 of these pages.) Shell oval, subequilateral, with numerous subscabrous striæ: margin entire. *Color*, soiled whitish or dull reddish. Length, 2·5; width, 1·5. *Florida.*

FAMILY AVICULIDÆ.

ANIMAL *with the mantle entirely open except along the back, without tubes or peculiar openings, and prolonged sometimes behind: foot moderate, with a byssus.* SHELL *often foliated, generally thin, pearly subequivalve. Hinge without teeth, or only showing small rudimentary teeth; an anterior notch for the passage of the byssus.*

Genus AVICULA, *Brug.* *Shell* oval, fragile, rather smooth: base transverse, straight; extremities produced. Hinge linear, unidentate between the beaks: area of the ligament marginal, narrow, channelled.

A. atlantica, Lam. (*A. hirundo*, SAY, Ac. Sc. Vol. 2, p. 262.) Shell with numerous undulated wrinkles disposed in rays: wings broad, rounded, scarcely oblique; valves unequal. *Color*, reddish brown. Width, 0·7. *Southern Coast.*

FAMILY ARCADÆ.

ANIMAL *resembling those of the preceding family, partly adherent, and with a foot always large. Marine.* SHELL *generally thick, regular, equivalve, inequilateral, with the hinge furnished on each valve with teeth in a regular series, often lamellar, straight or oblique. Muscular impressions two on each valve, almost always united by a palleal impression, very narrow, and parallel with the margin of the shell.*

GENUS ARCA. *Linnæus.*

Animal with the labial appendages very small and slender. Foot pedunculated, compressed, and divided throughout its length. *Shell* rather solid: beaks distant, separated by the area of the ligament. Hinge-margin straight, linear, without ribs at the extremities: teeth numerous, crowded, alternately inserted into each other; ligament entirely internal

ARCA PEXATA.

PLATE XII. FIG. 211.

(STATE COLLECTION.)

Arca pexata. SAY, Jour. Acad. Nat. Sciences, Vol. 2, p. 268.
A. id. GOULD, Invertebrata of Mass. p. 95, fig. 60.

Description. Shell thick and heavy, transversely ovate, inequilateral. Surface with thirty two to thirty-six radiating ribs, which are nearer to each other than their own diameters, and strongly impressed along the margin within. Beaks ventricose and prominent, obliquely directed; space between them very narrow. Valves closing accurately all round, obtusely angular on the anterior edge near the hinge margin. Epidermis consisting of long and fibrous threads, which are thickly distributed over the whole surface.

Color of the epidermis dark brownish or black; polished white within.

Length. 2·0. Transverse diameter, 2·5.

This is a common species along our coast. Its northern limits appear not to extend beyond Cape Cod. I am not aware how far it ranges to the south. According to Mr. Say, this species, when violently opened, gives issue to a bloody sanies, whence it has derived its name of *Bloody clam.* This remarkably well characterized and very common species has now been described and known by American naturalists for more than twenty years, and yet it does not appear in the latest and best lists of species given by foreign writers.

Arca transversa.

PLATE XII. FIG. 212.

Arca transversa. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 269.
A. id. Gould, Invertebrata of Mass p. 96.

Description. Shell smaller than the preceding, thick, transversely oblong, subrhomboidal. Surface with from thirty-two to thirty-five strong radiating ribs, obsolete on the beaks, and crossed towards the lower margin by two or more concentric furrows of growth: these ribs are nearly their own diameters apart, and become larger near the margin. Beaks prominent, incurved, and separated by a long and narrow interval: they are placed at the end of the anterior third of the length of the hinge-margin. Valves slightly unequal, so that the margin of one passes slightly beyond the other; this is most conspicuous on the posterior portions of the lower margin: a slight curve at each extremity of the hinge-margin. One or more angulated lines on the hinge space, drawn from the beaks to the hinge edge: valves accurately closing all round.

Color. Dingy white, sometimes tinged with reddish, and particularly adherent about the lower margin. Epidermis chesnut-brown, foliaceous.

Length, 0·5 – 0·8. Transverse diameter, 1·0 – 1.4.

This is also a very common species on our coast. It ranges north nearly to Cape Cod, and occurs on the coast of New-Jersey.

(*EXTRA-LIMITAL.*)

A. ponderosa. (Say, Ac. Sc. Vol. 2, p. 267.) Shell very thick and ponderous, somewhat oblique, with 25 – 28 ribs, each marked with an impressed line. Beaks distant, and opposite the middle of the hinge: lower margin nearly straight, or contracted in the middle. Length, 2; transverse diameter, 2·5. *Southern Coast.*

A. incongrua. (Id. Ib. Vol. 2, p. 268.) Shell somewhat rhomboidal, with 26 – 28 ribs, nearer than their own diameters, and crossed by elevated obtuse equal and equidistant lines, which are altogether wanting on ten rays of the disk of the left valve. Beaks distant, opposite the middle of the hinge, with a lanceolate space between: anterior margin cordate, flattened. Allied to *A. rhombea*, Born. Length, 2·0; transverse diameter, 2·1. *Southern Coast.*

GENUS NUCULA. *Lamarck.*

Animal with its mantle open only on its lower margin, denticulated along the back: buccal appendages anterior, long-pointed, stiff and applied against each other. Gills on each side and above, narrow and almost as long as the whole animal: foot very large, forming an oval disk, with its edges digitated. *Shell* transverse; no area for the ligament between the beaks: a straight series of teeth on each side, forming an angle at a spoon-shaped pit which separates them: ligament partly interior.

Obs. This genus has been chiefly illustrated in its American species by Messrs Couthouy, Gould and Storer. About ten species have been discovered on the coast of the United States. Some of them have the power of leaping to a great distance, as we have noticed under the head of *Pecten concentricus.*

Nucula thraciæformis.

PLATE XII. FIG. 217. A. B.

Nucula thraciæformis. Storer, Bost. Journ. Nat. Hist. Vol. 2, p. 122 (woodcut).
N. id. Gould, Invertebrata of Mass. p. 97, fig. 66.

Description. Shell large, solid, oblong-ovate, broadest behind, gaping at both ends. An oblique prominent fold extends from the beak to the posterior third of the basal margin, forming a distinct impression within; another fold, but not so distinct, radiates from the beak, and forms an acute angle with the hinge margin: these folds give a peculiar undulating form to the posterior surface of the shell. Beaks on the anterior third of the shell, somewhat elevated, pointed, inclined backwards, and nearly touching each other; their internal cavities capacious. Teeth very prominent; with about fourteen teeth on each side of the large central cavity or pit: these teeth are angular, regular, equidistant, and highest in the middle of each series, closely interlocking with those of the other valve.

Color. Brownish olive, varied with fuscous: beaks reddish brown; within polished white, tinged with bluish.

Length, 1·3. Transverse diameter, 2.1.

The specimens noticed by Dr. Gould are of larger dimensions than this, which was kindly loaned to me by Dr. Jay for description, and which he obtained from the stomach of a cod-fish on our coast. Those described by Dr. Storer and Gould were found in the stomachs of the *P. dentata*, or *Sand-dab.* It is a large and beautifully distinct species.

Nucula radiata.

PLATE XII. FIG. 216.

Description. Shell rather solid, very oblique, triangular. Surface polished, with minute concentric lines, and occasional larger ones; these concentric lines are rendered waving by a furrow running from the beak to the base, parallel to and at a short distance from the anterior side. Beaks anterior, large and eroded. Teeth minute, the two series forming almost a right angle with each other: four to five in one series, and from nine to ten in the other; the inner is deeply crenulated on the margin by numerous striæ radiating from the cavity of the beaks, but not impressed externally.

Color. Epidermis thin, ferruginous; beneath whitish pellucid; within bluish iridescent.

Length, 0·18.

Under this name, I venture to indicate a shell which was obtained by Dr. C. H. Stillman, by dredging in the East river opposite Williamsburgh: some thirty or forty other specimens were procured at the same time. In the number of its teeth, and the strongly impressed radiating striæ, it is very distinct from its otherwise strongly allied species *N. proxima.*

Nucula proxima.

PLATE XII. FIG. 215.

Nucula	*proxima.*	Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 270.
N.	*id.*	Conrad, American Mar. Conchology, pl. 6. fig. 2.
N.	*id.*	Gould, Invertebrata of Mass. p. 103, fig. 63.

Description. Shell small, solid, subglobose, trigonal, oblique, polished, concentrically wrinkled with numerous hardly perceptible striæ: beaks somewhat elevated and inclined forwards; pit of the cartilage very small. Teeth very robust for the size of the shell, long, acute, recurved and equidistant; twelve in number before, and about twenty behind the beaks. Margin very minutely crenulated; the crenæ extending some distance from the margin, but not forming radiated striæ as in the preceding.

Color. Epidermis light olive and very thin; within pearly white.

Legth, 0·45. Transverse diameter, 0·35.

This species, although not yet detected on our coast, will undoubtedly be found, as it ranges from Massachusetts bay along the southern coast. It is closely allied to, but as we think very distinct from, the preceding.

Nucula gouldi.

PLATE XIII. FIG. 221. A. B.

(STATE COLLECTION.)

Description. Shell thin, ovate, subequilateral; the valves gape more widely at one extremity, with slightly impressed concentric striæ: posterior dorsal margin slightly curved; anterior dorsal area with a very slight central carination; anterior margin slightly rostrate, with three or four imbricated striæ on the sides, extending from the beaks to the margin, where the imbrications are most apparent; basal margin regularly rounded and entire. Teeth eighteen in each valve, oblique, triangular, slightly directed upwards. Beaks decorticated, contiguous, nearly medial. Ligamentary pit profound; ligament wholly interior, black: muscular impressions distinct, oblong-oval, the posterior most profound.

Color. Epidermis olive-green, with a few paler concentric lines, becoming still lighter towards the anterior extremity; within pale bluish white, approaching to iridescence.

Length, 0·4. Transverse diameter, 0·8.

This description was made from a single specimen obtained in Long island sound. It resembles *myalis* in its general form, but differs in the number of its teeth, in its size, and the conformation of its posterior side, which is not subtriangular. I have named it after one of our most accurate conchologists, Dr. A. A. Gould.

(*EXTRA-LIMITAL.*)

N. myalis. (Couthouy, Bost. Jour. Vol. 2, p. 61, pl. 3, fig. 7. Pl. 13, fig. 219 of these pages.) Shell ovate, thin, smooth, slightly gaping at both extremities: anterior side longest and rounded; posterior side subtriangular, acuminated and subrostrated. Teeth about twelve on each side, increasing in size and distance towards the outer extremities: surface with minute radiating striæ. *Color:* epidermis olive; within glossy white. Length, 1·0; transverse diameter, 1·6. Stomachs of fishes. *Northern Coast.*

N. limatula. (Say, Am. Conch. pl. 12. Conrad, pl. 6, fig. 1. Pl. 13, fig. 218 of these pages.) Shell elongate, subovate, smooth-polished. Beaks nearly medial, not prominent, above the curve of the hinge-margin, rostrated. Teeth nineteen to twenty-two on the anterior, and eighteen on the rostrated side. *Color:* epidermis light green. Length, 0·8 – 1·0; transverse diameter, 1·9 – 2·3. *Shores of Maine and Massachusetts.*

N. sapotilla. (Gould, Invert. Mass. p. 100, fig. 61. Pl. 13, fig. 220 of this book.) Shell thin, elongate, inequilateral, subrostrated, tumid at the beaks, with a slight flexure under the posterior tip. Teeth about sixteen or eighteen on each side. *Color*, pale yellowish green. Length, 0·45; transverse diameter, 0·8. *Fishes on the Northern Coast.*

N. navicularis. (Couthouy, Bost. Jour. Vol. 2, p. 178, pl. 4, fig. 4.) Shell small, fragile, crescent-shaped, inequilateral: surface smooth, rounded before, slightly truncated behind; umbones tumid; basal margin strongly curved. Teeth eight before and ten behind the pit. *Color:* epidermis light pea-green. Length, 0·5; transverse diameter, 0·25. Stomachs of fishes.

N. tenuis. (Gould, l. c. p. 105, pl. 54.) Shell small, thin, trapezoidal, smooth, without radiating lines: beaks prominent, placed anteriorly; margin simple. Teeth long and slender, about eight behind and four or five before the beaks. *Color:* epidermis grass-green. Length, 0·25; transverse diameter, 0·3. Stomachs of fishes.

N. minuta. (Gould, l. c. p. 101. *N. tenuisulcata,* Couthouy, Bost. Jour. Vol. 2, p. 64, pl. 3, fig. 8. Pl. 12, fig. 213 of this book.) Shell ovate, lanceolate, inequilateral, posteriorly much narrowed and rostrated: surface with numerous concentric ridges. Teeth twelve before and sixteen behind the beaks. *Color:* epidermis light greenish yellow. Length, 0·9; transverse diameter, 1·0. Stomachs of fishes.

N. acuta. (Conrad, Mar. Conchol. pl. 6, fig. 2.) Shell very small, ovate-elongate, convex, with numerous concentric striæ. Beaks behind the centre pit, very small. Width, 0·2. This was found in so very recent a fossil deposit, as to induce Mr. Conrad to suppose that it may still be found on the coast, but overlooked on account of its size. *Virginia.*

FAMILY MYTILIDÆ.

Animal *oval, moderately thick, with its mantle open throughout its lower portion and adhering towards its edges; a separate opening behind for the excrements, forming very rarely a tube. Foot tongue-shaped, channelled, and with a byssus behind. With a very few exceptions, marine.* Shell *usually with an epidermis, equivalve, very inequilateral. Hinge without teeth; ligament linear, marginal, partly included: posterior muscular impression very small; the anterior large.*

GENUS MYTILUS. *Linnæus.*

Animal with the lobes of the mantle fringed about the opening of the vent. Mouth moderately large, with two pair of soft triangular labial appendages. Foot slender, cylindrical, with a silky byssus at its base and posteriorly. *Shell* longitudinal, subtriangular; apex acute, pointed at base, and fixed by a byssus. Beaks terminal, pointed, nearly straight. Hinge lateral, usually without teeth; ligament marginal, deeply seated, rectilinear, partly internal. Muscular impressions elongated, club-shaped; the anterior largest: palleal impression entire.

Obs. The species of this and the following genus are popularly known under the name of *Mussels.*

Mytilus borealis.

PLATE XIII. FIG. 222.

(STATE COLLECTION.)

Mytilus borealis. Lam. An. sans vert. Vol. 3, p. 21, No. 25, Ed. Brux.
M. edulis. Gould, Invertebrata of Mass. p. 121, fig. 82.

Description. Shell solid, elongate, subtriangular, somewhat ventricose, smooth, shining, flattish on the posterior and somewhat angulated and keeled on the anterior margin. Beaks tumid, pointed. Hinge an inch long, with numerous tooth-like elevations and cavities. Basal margin curved and scooped out, with a small fissure for the passage of the byssus.

Color. Black or greenish black; within blue-black on the margin; purplish and bluish white in the cavity.

Length, one to two and a half inches.

This species is common on the northern seacoast of the United States. On the coast of Long island it is used to some extent, as well as the *M. plicatula,* as a manure, for which eighteen cents per bushel is paid.

We follow Lamarck in considering this as distinct from the common *edulis* of Europe, with which, however, it is closely allied. In several specimens, it may admit of doubt whether the beaks are even terminal. There is a variety.

Mytilus notatus.

PLATE XIII. FIG. 223.

(STATE COLLECTION.)

Description. Shell oblong, oblique, with minute concentric striæ, smooth, compressed, angulated on the anterior side, regularly rounded on the basal margin, which is entire; the posterior margin slightly plicate. Beaks distinct, contiguous, terminal: a small bifid tooth under the beak, received into a corresponding depression in the other valve.

Color. Reddish brown, with deep purple zigzag marks; posterior surface chesnut-brown; within bluish purple, iridescent.

Length, 1·7. Width, 0·8.

I am not sure whether the following species, which is regarded by some conchologists as a variety of *borealis,* may not be identical with *notatus.*

Mytilus pellucidus.

PLATE XXIV. FIG. 256.

Mytilus pellucidus. Pennant, Br. Zool. Vol. 4, p. 237, pl. 66, fig. 3.
M. id. Turton, Conchol. Brit. Ins. p. 197, pl. 15, figs. 1 and 2.
M. edulis, var. *pellucidus.* Gould, Invertebrata of Mass. p. 122.

Description. Shell oblong, convex, pellucid, smooth, with very minute concentric wrinkles; anterior margin in young specimens nearly straight, more curved with age. Beaks small, approximated, scarcely terminal, occasionally with two or three teeth, but these are more often wanting: posterior margin produced and more or less angulated.

Color. Light horn-color or yellowish, but more usually dark horn, with vertical blue radiations, most conspicuous when held against the light; as the animal increases in size, these radiations become more numerous. Within a rich ultramarine blue, particularly towards the margins.

Length, 0·4 – 1·2. Width across the beaks, 0·6 – 2·1.

In very young specimens, the surface of the valves is furnished with scattering hairs, and the basal margin is lineated. As the genera *Mytilus* and *Modiola* now stand, it is doubtful in many specimens to assign its true position.

(*EXTRA-LIMITAL.*)

M. incurvatus, Lam. Shell oval, thick, opake, tumid, much incurved on the anterior side: beaks divaricate, with two or three teeth only under them. *Color*, bluish grey. Length, 1·4. An var. *M. borealis? Northern shores of Europe and America.*

M. ungulatus, Linn. Shell oblong, ventricose, roughened with transverse plaits, curved on the anterior side, and the summits conical and diverging: hinge with from three to five minute teeth. *Color:* epidermis blackish or purple; in the young, the epidermis green, and occasionally with reddish zigzag lines. Length, 4·0 – 5·0; width, 2·0 – 2·4. *Coast of Europe and America.*

M. cubitus. (Say, Ac. Sc. Vol. 2, p. 263.) Shell oblong, striated, with elevated subglabrous lines which are smaller on the anterior side: anterior edge linear or slightly concave; posterior edge ascending from the base in a right line to a prominent posterior angle, which is rather behind the middle of the shell, from which it descends by a concave line to the obliquely and very obtusely rounded tip. *Color*, yellowish, polished, and somewhat fasciated with green or brownish, disappearing on the anterior margin. Length, 1·2; breadth, 0·5. *Seacoast.*

M. lateralis. (Id. Ib. p. 264.) Shell transversely oval, inflated, subpellucid, with numerous concentric wrinkles: anterior and posterior margins longitudinally ribbed, and crenating the basal margin; intermediate area without longitudinal lines: the most prominent part of the shell extending from the beak to the tip of the anterior margin, and bounded on its posterior side by an indented line. *Color:* epidermis pale brown. Length, 0·3; breadth, 0·5. *Southern coast.*

M. hamatus. (Id. Ac. Sc. Vol. 2, p. 264; Am. Conch. pl. 50. *M. striatus*, Barnes, Am. Jour. Vol. 6, p. 364.) Shell very much contracted and incurved at the base, which is acute. Valve

striate every where with longitudinal elevated lines, which are bifid and sometimes trifid towards the tip. *Color*, dark fuscous with purpurescent, with a whitish margin. Length, 1·2; breadth, 0·8. *Southern coast.*

M. leucopheatus. (Conrad, Ac. Sc. Vol. 6, p. 263, pl. 11, fig. 13.) Shell incurved, with a very rugose epidermis; anterior side much depressed. Hinge-margin excavated, with the teeth obsolete; on the posterior side, under the beaks, is a pointed lamellar tooth, directed inwards. *Southern coast.*

GENUS MODIOLA. *Lamarck.*

Animal resembling in every respect those of the preceding genus. *Shell* oblique, wedge-shaped. Beaks very near the anterior end, but not terminal.

Obs. If we admit the zoological principle, that animals of the same organization should be classed in the same genus, it would be difficult to say why this genus should be allowed to remain. The only constant external character is supposed to lie in the beaks; and yet we are assured by high conchological authority, that if a large number of species of *Mytilus* and *Modiola* are examined, we shall find the beaks so gradually passing from subterminal to terminal, that it is impossible to define the limits between the two genera. As, however, the division affords some assistance in determining the numerous species, and is adopted by many eminent conchologists, we shall follow their arrangement.

Modiola plicatula.

PLATE XXIV. FIG. 258.

(STATE COLLECTION.)

Modiola plicatula. Lam. An. sans vert. Vol. 3, p. 10. Ed. Brux.
M. semicostata. Conrad, Jour. Acad. Nat. Sciences, Vol. 7, p. 244, pl. 20, fig. 7.
M. plicatula. Gould, Invertebrata of Mass. p. 125, fig. 81.

Description. Shell oblong, obliquely dilated, somewhat falciform. Surface with approximated deep furrows, radiating towards the dilated margin, fainter on the basal margin, but more distinct near the beaks, which are smooth, often eroded: a few distant concentric narrow impressed lines crossing the radiating striæ. Beaks prominent, rounded: hinge-margin straight, ascending; basal margin concave, depressed, with a small fissure for the exit of the byssus.

Color. Epidermis greenish yellow, occasionally reddish brown; within pearly, with faint purplish tints.

Length, 0·8 – 1·5. Width, 2·4 – 4·5.

This is common every where along the coast, on salt-marshes, and along the margins of creeks and other tide estuaries. When decorticated, the interior often exhibits a brilliant nacre.

Modiola modiolus.

PLATE XXIV. FIG. 257.

(STATE COLLECTION.)

Mytilus modiolus. Linn. Syst. Nat. 1158.
Modiola papuana. Lam. An. sans vert. Vol. 3, p. 11, Ed. Brux.
M. id. Say, Am. Conch. pl. 45. Turton, Conch. Ins. Brit. pl. 15, fig. 3 (Young).
M. modiolus. Gould, Invertebrata of Mass. p. 123.

Description. Shell large, coarse and solid, oblong, obliquely dilated. Beaks tumid, obtusely angulated, placed on one side, and nearly approaching the anterior margin. Basal margin concave, with a fissure for the byssus. Surface coarsely marked with deep incremental lines; the groove for the ligament deep and elongated.

Color. Epidermis thick and folded within the margins, dark violaceous approaching to black, occasionally chesnut brown; lighter along the ridge from the beaks; within, pearly.

Longest axis, 4·5 – 6·0; shortest, 2·5 – 3·0.

This species occurs in deep water along the whole coast, and is usually found after heavy storms. It is subject to many variations in form, which have given rise, according to Dr. Gould, to several nominal species, such as *M. umbilicatus, barbatus,* and *gibbsii.* The true *M. papuana,* with which this has been confounded, as its name would seem to imply, is an East-Indian shell: the animal is dark orange or reddish.

(*EXTRA-LIMITAL.*)

M. pectinula. (Gould, Invertebrata of Mass. p. 127, fig. 85.) Shell obovate, ventricose, with about forty equal radiating ribs; beaks prominent, projecting as far as the anterior margin; entire margin crenulated by the ribs. *Color:* epidermis brownish yellow. Longest diameter, 0·7; shortest, 0·3. *St. George's Bank.*

M. nexa. (Id. Ib. fig. 86.) Shell ovate: beaks prominent, and placed considerably behind the anterior extremity, minutely reticulated with fine corrugated concentric and radiating lines; front of the beaks radiated. *Color:* epidermis rusty brown with shades of olive, glossy. Length, 0·7; shortest axis, 0·4. *Provincetown, Mass.*

M. discrepans, Montagu. (Gould, Ib. p. 129, fig. 83.) Shell suboval, broadest behind: beaks nearly terminal; hinder extremity somewhat lobed. Surface divided into three compartments, of which the anterior is marked by about eight, and the posterior by numerous radiating lines. *Color:* epidermis olive-green. Length, 1·0; breadth, 0·4. Stomachs of fishes. *Coast of Massachusetts.*

M. discors, Montagu. (Gould, Ib. p. 130, fig. 84.) Shell oval, tumid: upper edge somewhat compressed and arching; posterior tip somewhat produced and pointed. Beaks large, nearly terminal: surface with about sixteen ribs at the anterior third, and very numerous ones at the posterior third; three or four teeth before the beaks. *Color:* epidermis greenish yellow, with clouds of olive. Length, 1·5; height, 0·3. Adhering to seaweed. *Coast of Massachusetts.*

M. carolinensis. (Conrad, Jour. Ac. Sc. Vol. 7, p. 244, pl. 20. fig. 6.) Shell dilated in the middle: disks with very numerous radiating striæ; lower margin rounded, and beautifully crenulate. *Color* greenish yellow; within yellowish, spotted with purple. *Crenella? Charleston, S. C.*

M. americana. (Leach, Zool. Misc. Vol. 2, pl. 72, fig. 1. Say, Ac. Sc. Vol. 2, p. 265.) Oblong. Hinge-margin elevated in a right line from the beak to the alated angle, from which it declines in a right line nearly to an equal distance; alar projection rounded: anterior margin short and small basal margin slightly contracted in the middle. *Color*: Epidermis transversely wrinkled, light brown; the raised oblique portion of the shell yellowish-white: cortex with membranous scales and filaments. Length. 0·6; breadth, 1·2. *Southern Coast.*

M. castanea. (Say, Ac. Sc. Vol. 2, p. 266.) Transversely oblong, suboval. Hinge-margin elevated in a right line from the beak to the alar angle, from which it descends in a slightly arcuated line; alar angle rounded: anterior margin rounded at the tip; posterior margin rather large: base with a slight contraction before the middle. *Color*: epidermis chesnut; within bluish. Length, 0·6; breadth, 1·1. *Southern Coast.*

GENUS CRENELLA. *Brown.*

Oblong-ovate, subequilateral, ventricose. Beaks obtuse, slightly turned to one side. Hinge without teeth, but with a flattened slightly crenated plate in each valve; the right valve with a triangular horizontal projecting reflexed plate, and the left one with an oblique plate, both of which are slightly crenated.

Crenella decussata.

PLATE XXII. FIG. 248.

(STATE COLLECTION.)

Mytilus decussatus. Laskey & Montagu, Mem. Wer. Soc. Vol. 1.
Crenella elliptica. Brown, Conch. Illus. pl. 31, figs. 12 – 14.
Modiola glandula. Totten, Am. Jour. Vol. 26, p. 367. pl. fig. 3.
M. id. Gould, Invertebrata of Mass. p. 131, fig. 87.

Description. Shell small, thin, oval, turgid, inequilateral, not gaping. Valves concentrically wrinkled and beautifully striated, with numerous small rounded ribs, radiating in all directions from the apex to the margins; cavity of the valves profound. Beaks distinct, recurved, not in contact, often decorticated: the entire margin minutely crenulated.

Color. Epidermis dull waxen yellow; within bluish white, somewhat pearly.

Leng, 0·2 – 0·45. Width, 0·15 – 0·35.

This little shell was first discovered by Col. Totten at Provincetown harbor, Mass., and, according to Dr. Gould, is one of the most common shells found in the stomachs of fishes on that coast. Under the latter circumstance, it will probably be detected on the coast of this State. The place of the genus is uncertain: it should probably be arranged near *Anatina.*

(*EXTRA-LIMITAL.*)

Genus PINNA, *Linneus.* *Shell* longitudinal, wedge-shaped, equivalve, gaping at the base and pointed at the summit, with the beaks straight and acute: hinge lateral and without teeth; ligament marginal, linear, very long and half interior. *Animal* with its foot tongue-shaped, conic, and bearing an ample byssus.

P. seminuda. (LAM. An. sans vert. Vol. 3, p. 27.) Shell with the apex very broad, obliquely truncated, with longitudinal scaly furrows; posterior side smooth. *Color*, reddish grey. *Southern Coast.*

P. muricata. (ID. Ib. p. 28.) Shell moderately large, thin, pellucid, subtruncate, with a few muricated longitudinal furrows. Scales small, erect, subacute. Allied to the preceding. *Southern Coast.*

FAMILY UNIONIDÆ.

ANIMAL *with the mantle entirely open beneath, with a particular opening for the vent; beneath this, an incomplete tube for respiration, furnished with tentacular papillæ. Foot very large and thick; without a byssus. Inhabiting fresh water.* SHELL *free, with an epidermis, equivalve, inequilateral, transverse. Hinge variable, sometimes furnished with an irregular simple or divided cardinal tooth, and a longitudinal one, which extends under the corslet; sometimes irregular granular tubercles in the place of teeth: in some species, entirely wanting. The posterior muscular impression subdivided.*

OBS. This family corresponds with the *Naiades* of Lamarck, and to a portion of the family *Submytilacés* of Blainville. It is a well characterized family, which is more than can be said of the genera into which it has been attempted to be subdivided, or many of the species. The form and number of the teeth are so variable, and run into each other by such insensible gradations until they become obsolete, that it has been doubted whether they may not all be reduced to one genus. North America is particularly rich in species. In the latest edition of Lamarck, out of one hundred species, fifty-four* are attributed to the United States; but this gives but a faint idea of the actual number described by American Conchologists. Say alone has described fifty-eight; Conrad has enumerated one hundred and sixteen; and Lea has carried the number beyond two hundred and fifty, most of which have been beautifully figured. There is so much discrepancy of opinion among these writers in relation to the species, and such a variety of forms requiring careful examination, that for fear of adding to the confusion, contrary to the plan hitherto pursued, I shall not cite under this family the extra-limital species.

* Many of these descriptions must have been drawn up from badly characterized specimens; for, in one instance alone, according to Mr. Lea, eight of Lamarck's species are purely nominal, and refer to one and the same species.

GENUS UNIO. *Bruguières.*

Animal with its mantle open throughout beneath, with thick edges, often fringed. A short posterior incomplete tube, furnished with two series of tentacular papillæ, subserving the purposes of respiration: triangular labial appendices. Gills moderately long, unequal, on the same side. Foot large, thick, rounded or subquadrangular. *Shell:* hinge with a stout, irregular, striated, simple or divided cardinal tooth in each valve, and an elongated compressed lateral tooth extending along the margin.

Obs. The shells of this and the other genera are popularly known under the names of *Freshwater clams* and *mussels.*

Unio complanatus.

PLATE XXII. FIG. 246.

(STATE COLLECTION.)

Mya complanata, Solander. Dillwyn, Cat. Vol. 1, p. 51.
Unio purpureus. Say, Nich. Ency. pl. 3, fig. 1.
U. id. Barnes, Am. Jour. Sc. Vol. 6, p. 264.
Margarita (Unio) complanata. Lea, Synopsis, Am. Phil. Tr. Vol. 6, p. 130.
U. complanatus. Russel, Essex Am. Jour. Vol. 1, p. 59. Adams, Am. Jour. Vol. 40, p. 276.
U. id. Gould, Invertebrata of Mass. p. 117, figs. 68, 69, 70.

Description. Shell varying from fragile to robust, oblong, very inequilateral. Ligament thick and stout, transversely ovate or more usually subrhomboidal, broadest behind, where the margin descends nearly in a straight line from the hinge-margin to the posterior extremity, which is subacutely rounded: lower margin regularly curved, occasionally slightly arched in the middle; hinge-margin elevated, compressed and carinate. Beaks usually much decorticated; anterior extremity regularly rounded. Hinge-teeth in one valve erect and strongly striated; in the other, bifid: lateral teeth elongated, slightly curved.

Color. Epidermis dark olive-green, occasionally in the young with faint narrow radiations: within bluish or silvery white, purple, reddish, greenish, sometimes one uniform color, and occasionally all intermixed.

Length, 1·5 – 2·5. Transverse diameter, 2·5 – 4·5.

This is a common species in almost every part of the State. I am indebted to Dr. Eights for the observation that this, as well as other fluviatile bivalves, are more perfect and ponderous in the canals and ponds than in quick running streams. Specimens obtained from Little-falls and Oak-orchard, were of a uniform dull reddish or purplish hue within.

Unio boydianus.

(STATE COLLECTION.)

Unio boydianus. Lea, Trans. Am. Phil. Society, Vol. 8, p. 216, pl. 16, fig. 32.

Description. Shell obovate, rather inflated, very inequilateral, subangulate before, with regular rather close and nearly equidistant marks of growth. Substance of the shell rather thin, thicker before. Beaks rather prominent, with small undulations at the tip: ligament rather short and thin. Epidermis yellowish brown, striate. Cardinal teeth compressed, double in both valves; lateral teeth long and nearly straight. Anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices on the under side of the cardinal tooth. Cavity of the shell deep and rounded; cavity of the beaks shallow and subangular. Nacre white and iridescent. Length, 1·2. Breadth, 1·9. Diameter, 0·8.

Such is the description by Mr. Lea of a species which is found in Oak-orchard creek, Orleans county. Dr. Boyd presented me with the same shells from that locality, and I then considered them as probably a variety of *U. ochraceus*, Say; to which, as Mr. Lea remarks, they are most nearly allied. My specimens were all radiated more or less distinctly behind.

Unio radiatus.

PLATE XVIII. FIG. 236.

(STATE COLLECTION.)

Mya radiata. Gmel. Syst. Nat. 3220.
Unio id. Lam. An. sans vert. Vol. 2, p. 663.
Unio radiatus. Barnes, Am. Journ. Sciences, Vol. 6, p. 265. Hildreth, Id. Vol. 14.
Margarita (Unio) id. Lea, Am. Phil. Tr. Vol. 3, p. 415; Vol. 6, p. 127, pl. 15, fig. 48, 49.
U. id. Conrad, Monog. pl. 10, fig. 2. Russel. Ess. Jour. Vol. 1, p. 60.
U. id. Gould, Invertebrata of Mass. p. 110, fig. 73.

Description. Shell varying from fragile to robust, oblong-ovate. Anterior margin narowed, regularly rounded; posterior broadest and angulated on its surface, rounded on its margin Beaks near the front of the shell, slightly elevated. Hinge-margin elevated, subcompressed. Cardinal teeth erect, triangular, bifid, crenulate.

Color. Epidermis light green or olive, with numerous darker green concentric zones, and lighter colored radiations from the beaks to every part of the margin; within bluish white, occasionally very iridescent.

Transverse diameter, 1·0 – 3·0; vertical ditto, 0·3 – 1·6.

This is also a common species, occurring everywhere through the Northern and Middle States. Those communicated to me from Massachusetts, appear to be more robust and somewhat more elongated than those procured in this State. It may be necessary to state, that many of the plates of this and the succeeding genera were drawn reversed, an error which was not discovered until the impressions were all printed off: with a knowledge of this fact, the reader will not be misled in studying the species.

Unio ventricosus.

Unio ventricosus. Barnes, Am. Jour. Sc. Vol. 6, p. 267, pl. 13, fig. 14.
U. id. Say, Am. Conch. pl. 32.
U. occidens? Lea, Trans. Am. Phil. Soc. Vol. 3, p. 435, pl. 10, fig. 16.
Margarita (Unio) id. Id. Ib. Vol. 6, p. 126.
U. ventricosus. Adams, Amer. Journ. Science, Vol. 40, p. 276.

Description. Shell moderately robust, subelliptical, ventricose. Beaks undulated, often decorticated: ligament stout. Cardinal teeth double in both valves. In one valve the external tooth is broad, curved and truncated above; the internal smaller and triangular; the lateral tooth simple, broad, and ending abruptly: in the other valve, the oblique cardinal teeth are placed behind each other, and both are pyramidal; the lateral tooth deeply cleft. Posterior impressions confluent; dorsal ones distinct: cavity of the beaks profound.

Color. Epidermis olive-green, with dark green radiations; within, pure white, or white with a faint tinge of blue, and slightly iridescent.

Vertical axis, 2·0; transverse ditto, 3·1.

This species I have received from Lake Champlain, and from other waters in the western part of the State. It is subject to great variations in form, but its ventricose character is constant.

I have adopted the synonimes of Say and Conrad, in part, in relation to this species. I have not, however, examined a specimen from the western waters: the figure of *occidens*, as given by Mr. Lea, and his description coincides with that of *ventricosus*.

Unio luteolus.

PLATE XX. FIG. 241.

(STATE COLLECTION.)

Unio luteolus. Lam. An. sans vert.
U. siliquoideus. Barnes, Am. Jour. Vol. 6, p. 269, pl. 13, fig. 15.
U. inflatus. Id. Ib. Vol. 6, p. 266.
Margarita (Unio) luteolus. Lea, Trans. Am. Phil. Vol. 6, p. 127.
U. inflatus. Conrad, Fr. Wat. Shells, p. 69.
U. luteolus. Id. Monog. pl. 10, fig. 1.
U. id. Adams, Am. Jour. Sc. Vol. 40, p. 276.

Description. Shell solid, oblong-ovate, moderately inflated, regularly rounded; hinge-margin straight. Beaks contiguous, very slightly elevated, regularly rounded at one extremity, subangulated at the other. Surface with concentric wrinkles, becoming somewhat squamous at one extremity. Cardinal teeth oblique, elevated, rugose on their sides, crenate at tip and edges; lateral teeth long and straight.

Color. Epidermis yellowish olive to dark brown, with a few faint distant radiations; within, varying from pearly white to bluish white, iridescent.

Vertical axis, 1·5 – 2·2; transverse ditto, 3·0 – 3·5. Diameter, 0·9 – 1·2.

Lamarck received his specimens from the Susquehannah and Mohawk rivers; Mr. Barnes, from Wisconsin river and Lake Erie. My specimens were procured from Sandy creek in Orleans county, Wolcott creek and Port bay on Lake Ontario, and from the Little falls and Lake Champlain. It approaches *U. tappanianus*, but is not as much alated, is a more solid shell, and is evidently distinguished from that shell by the teeth.

Unio compressus.

PLATE XXI. FIG. 245.

(STATE COLLECTION.)

Symphonota compressa. Lea, Trans. Phil. Vol. 3, p. 450, pl. 12, fig. 22.
Margarita (Unio) compressa. Id. Ib. Vol. 6, p. 121.
Unio compressus. Conrad, Fr. Wat. Shells, p. 68. Adams, Am. Jour. Vol. 40, p. 276.

Description. Shell flattened, moderately thin, compressed, subtriangular; beaks with double concentric undulations: ligament concealed within the valves. Hinge-margin nearly straight, subangular, on the posterior margin. The posterior cardinal tooth in one valve highest, curved, and passing into the lamellar tooth, which is narrowly channelled throughout; the central one often dentate: a single broad cardinal tooth in the other valve; the lateral tooth simple, with two rudimentary teeth parallel with it near its termination.

Color. Olive brown or greenish, which increases in intensity towards the beaks, with occasionally faint radiations with bluish white; salmon-colored towards the cavities of the beaks.

Vertical axis, 1·1 – 1·7; transverse ditto, 1·7 – 2·8.

Through the kindness of the late Dr. Boyd, I have received specimens of this species from Sandy creek in Jefferson county, and Oak-orchard creek in Orleans county. It occurs near Middlebury, Vermont.

Unio nasutus.

PLATE XX. FIG. 239.

(STATE COLLECTION.)

Unio nasutus. Say, Nich. Ency. Vol. 4, pl. 4, fig. 1.
U. rostratus. Val. Humboldt & Bonpland, Rec. de Zoologie, Vol. 2, p. 233, pl. 53, fig.
U. nasutus. Barnes, American Jour. Science, Vol. 6, p. 273.
U. id. Conrad, Monog. pl. 18, fig. 1. Russel, Essex Jour. Vol. 1, p. 60.
U. id. Lea, Synopsis, etc., p. 132. Gould, Invertebrata of Mass. p. 109, fig. 71.

Description. Shell oblong-lanceolate and somewhat produced or rostrated at one extremity, regularly rounded at the other. Valves thin in running streams, more stout and solid in the lakes. Beaks small and little elevated, with a few corrugations. An elevated ridge runs from the beaks to the rostrated extremity, and above this the valves are much depressed, with a few broad radiating furrows on the surface. Lower margin regularly rounded, until it ap-

proaches the rostrated extremity, when it becomes perceptibly concave. Ligament long, elevated and prominent. Cardinal teeth small, oblique, compressed, tripartite, crenate; lateral teeth crenate on the edges. Surface smooth, occasionally concentrically squamous.

Color. Epidermis greenish brown and brownish, approaching often to black; beaks lighter: within bluish white, iridescent, often salmon-colored.

Vertical axis, 1·4; transverse ditto, 3·2.

The specimen which furnished the above description was obtained from Wolcott creek, Lake Ontario. It corresponds in the main with the description of my late friend Mr. Barnes, but is much larger, more solid, and of a uniform deep salmon-color within. Dr. Newcomb has, I understand, detected in the Champlain canal a variety ? of this species, with a single tooth in the left valve.

Unio rosaceus.

PLATE XXXIX. FIGS. 355 (Adult); 356 (Young). — PLATE 40. FIG. 357 (Sexual variety).

(STATE COLLECTION.)

Description. Shell moderately solid; in the adult, rather inflated; in the less mature specimens, somewhat compressed; regularly and shortly rounded at one extremity, broadly rounded at the other, slightly alated above the hinge-margin, and in the adult this alation obscurely plaited. Basal margin usually widely rounded: occasionally distinctly compressed in the middle of the basal margin, by one or more impressed oblique lines, which are said to be a sexual distinction (See fig. 356): these lines are not apparent in the adult. Beaks prominent, incurved, approximate, decorticated. Shell slightly gaping at the shorter extremity. Surface lustrous, strongly impressed by the lines of growth. Cardinal teeth in one valve, two; the anterior small, obliquely directed forward; the posterior large, triangular, erect, its summit incurved upward; lateral tooth distinct and broad: in the other valve, the cardinal teeth are subequal, crenulated and separated by a deep pit, and are strengthened in both valves by a strong rib beneath extending across the shell. Anterior muscular impression deep, with a small oval depression behind it at the base of the rib above mentioned.

Color. Yellowish brown; in the younger specimens, with a faint greenish tinge at the anterior extremity: within iridescent, rosaceous; in the younger specimens, bluish white.

Vertical axis, 1·5; transverse ditto, 2·5. Diameter, 0·8.

Many specimens of this shell have been received from Dr. Sartwell, from Seneca lake (fig. 356 as the female, and 357 as the male shell). I find no description which coincides with the characters of the above shell. It is undoubtedly allied to *N. cariosus* and *luteolus;* from the latter, which it most resembles in form, it is readily distinguished by the cardinal teeth.

Unio ochraceus.

PLATE XIX. FIGS. 237, 238.

(STATE COLLECTION.)

Unio ochraceus. Say, Nich. Encyl. Vol. 4, pl. 2, fig. 8.
Symphonota ochracea, and *Margarita id.* Lea, Am. Phil. Tr. Vol. 3, p. 69; Vol. 6, p. 126, pl. 15, fig. 44.
U. ochraceus. Conrad, Monog. Unionidæ, pl. 17, fig. 2. Gould, Inv. Mass. p. 112, fig. 74.

Description. Shell thin, translucent, subovate, ventricose: valves smooth. Hinge-margin nearly straight, angulated at each end. Beaks elevated and approximated, directed forwards, with a few concentric undulations. A rib, strongly impressed within, passes obliquely from the beaks to the posterior margin, enclosing a depressed area with the margins carinated; this rib gives a subangulated appearance to the posterior margin: the other extremity rounded, gaping. Cardinal teeth very oblique and much compressed, striated, and nearly parallel with the hinge-margin; lateral teeth short.

Color. Epidermis varying from pale reddish to yellow olive and green, with colored radiations and dusky concentric bands; within bluish tinged with red, occasionally uniform rose-red, and often of a beautiful scarlet or salmon-color.

Vertical axis, 1·0 – 2·0; transverse ditto, 1·8 – 2·8.

Fig. 237 is from the Mohawk river. The variety fig. 238, from Second river near Belleville, is introduced for its brilliant interior, and is more solid than any specimens which have come under my notice.

Unio cariosus.

PLATE XXI. FIGS. 243, and 244 (Variety).

Unio cariosus. Say, Nich. Ency. Vol. 4, pl. 3, fig. 2. Barnes, Am. Jour. Vol. 6, p. 271.
U. cariosa. Lamarck, An. sans vert. Vol. 3, p. 671, Ed. Brux.
U. ovata. Val. Obs. de Zool. Vol. 2, p. 226, pl. 50, fig. 1.
Margarita (*Unio*) *cariosa.* Lea, Trans. Am. Phil. Soc. Vol. 6, p. 126, pl. 15, fig. 45.
Unio cariosa. Conrad, Unionidæ, p. 40, pl. 19 (*crassus*, Say). Conrad, Fr. Wat. Sh. p. 68.
U. id. Gould, Invertebrata of Massachusetts, p. 111, fig. 72.

Description. Shell ovate, inflated, moderately thin. Beaks somewhat prominent, much eroded, with a prominent ridge passing from the beaks to the posterior margin. Teeth oblique: cardinal teeth broad, oblique and compressed. Cavity of the beaks moderate. Surface occasionally verrucose.

Color. Epidermis olive brown or greenish, commonly with a few distant deep green narrow radiations, most conspicuous on the posterior portion; the decorticated beaks wax-yellow or opake white: within, bluish white, rose-red, and even salmon-color.

Vertical axis, 2·0 – 2·5; transverse ditto, 3·5 – 4·0.

This fine shell is found of extraordinary size and beauty in the River Passaic, near Belleville. Those from the Hudson are usually smaller and less solid than the Jersey specimens.

Unio novi-eboraci.

PLATE XX. FIG. 240.

(CABINET OF DRS. JAY AND BUDD.)

Unio novi-eboraci. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 104, pl. 24, fig. 114.

Description. Shell elliptical, somewhat compressed. Substance of the shell rather thick; thinner on the posterior portion. Beaks somewhat prominent, and minutely undulated at the tip. Cardinal teeth large, erect, and deeply cleft in the left valve; lateral teeth long, straight, and separated from the cardinal teeth. Anterior cicatrices distinct; posterior confluent: dorsal cicatrices placed in the centre of the cavity of the beaks. Cavity of the shell shallow; of the beaks subangular and shallow.

Color. Epidermis yellow, with green rays nearly over the whole disk; nacre white, and very iridescent on the posterior portion.

Length, 1·1. Width, 2·2. Diameter, 0·7.

This species, according to Mr. Lea, whose description I have copied, is closely allied to *U. iris.* It is, however, a thicker shell, more angular behind, and not quite so transverse; the epidermis is also more yellow. Mr. Lea's specimens were from Oak-orchard creek, Orleans county. In its form it much resembles the *U. pictorum* of Europe, but is more robust. Its teeth distinguish it sufficiently from *U. radiatus.* I am indebted to Dr. Budd for a specimen from another locality, which is one-third larger than that described by Mr. Lea.

Unio tappanianus.

PLATE XX. FIG. 242.

(STATE COLLECTION.)

Unio tappanianus. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 62, pl. 17, fig. 55.

Description. Shell rather thin, somewhat compressed, regularly rounded in front, dilated behind, subalated above. Posterior slope oblique (in some specimens nearly straight): basal margin slightly arcuate. Beaks in the anterior third of the shell, slightly prominent, with double undulations. Cardinal teeth small, wide; that of the left valve double, but this is not constantly very distinct (in the largest specimens it is single); lateral teeth small, simple, linear. Surface with three or more strong concentric folds, which are most robust on the anterior portion, and appear on the inner surface. Within, the cavity is capacious; under the beaks, angular.

Color, varying from dusky brown to olive brown, with faint narrow greenish radiations, most conspicuous behind.

Length, 0·8 – 1·2. Transverse diameter, 1·4 – 2·2.

This shell was presented to me by Dr. Budd, who obtained it from Dr. Newcomb, by whom it was detected in the northern canal near Troy. Mr. Lea's specimens were from the Juniata, and from the Schuylkill near Philadelphia. Its northern geographical limits are consequently much extended. In the specimens before me, the double cardinal teeth become united into one in the larger individuals.

Unio alatus.

Unio alatus. Say, Nich. Encyclopedia, Vol. 4, pl. 4, fig. 2.
U. id. Barnes, American Journ. Science, Vol. 6, p. 260.
U. id. Adams, American Journal of Science, Vol. 10, p. 276.

Description. Shell large, varying from moderately thick to very thin and fragile, subtriangular, generally gaping at the posterior part of the base, fuscous, wrinkled. Beaks not prominent, placed very much on one side, and decorticated: base nearly straight. Hinge-margin very oblique, rising near the termination of the cartilage into an alated projection, and forming almost a right angle with the inferior slope, which is nearly equal in length; often with numerous tubercles within, which upon the gaping extremities are confluent: cicatrices very rough. Teeth crenate; the outer laminated one obsolete, only one in each valve being perceptible.

Color. Epidermis brownish; within purple red.

Length, 3·8. Transverse diameter, 5·5.

This large and well characterized species was observed by Mr. Lesueur in Lake Erie. It occurs also in Lake Champlain; and Dr. Newcomb has obtained very fine specimens from the Northern canal, near Waterford.

Unio rectus.

Unio recta. Lam. An. sans vert. Vol. 3, p. 669.
U. prælongus. Barnes, Amer. Jour. Sc. Vol. 6, p. 261, pl. 13, fig. 11.
U. rectus. Lea, Tr. Am. Phil. Soc. Vol. 5, p. 26. Adams, Am. Journal Sc. Vol. 41, p. 276.

Description. Shell thick, elongated, narrow, tumid, somewhat pointed in front, obtusely rounded behind. Beaks little elevated: basal margin slightly compressed, and in old specimens arched; lateral tooth long and thin.

Color. Epidermis blackish brown; in young specimens, with yellowish radiations.

Vertical axis, 2·5 – 2·7; transverse ditto, 5·5 – 6·5.

This species is found in Lake Champlain.

GENUS ALASMODON. *Say.*

Animal resembling that of *Unio*. *Shell* with a primary tooth on each side: no lateral tooth.

ALASMODON RUGOSA.

PLATE XIV. FIG. 226.

(STATE COLLECTION.)

Alasmodonta rugosa. BARNES, Am. Jour. Sc. Vol. 6, p. 278, pl. 13, fig. 21.
Margarita (*Margaritana*) *rugosa.* LEA, Trans. Am. Phil. Soc. Synopsis, p. 135.
A. rugosa. ADAMS, Am. Jour. Sc. Vol. 40, p. 276.

Description. Shell oblong-oval, moderately compressed, rather broader in front. Beaks slightly elevated, wrinkled, and, when decorticated, exibiting a waxen color beneath. Ligament external, and as high as the beaks. Anterior lunule distinct, with a slightly elevated ridge extending from the beaks to the anterior basal margin, which is very slightly contracted. Surface, towards the anterior margin, folded in a pinnate form: folds deeper above, somewhat obsolete below; the ridge curved upward, and extending to the hinge and anterior margins, indenting the edge and visible within. Teeth large, elevated, serrate, with a fold behind: cavity small.

Color. Epidermis dark olive and of a silken lustre, frequently with pale narrow radiations; within bluish white, salmon-colored towards the cavity of the beaks, faintly iridescent.

Vertical axis, 2·0 – 2·9; transverse ditto, 3·1 – 3·7.

This very beautiful and distinct species figured above, was obtained from Oswego river. In others, procured from Oak-orchard creek, Orleans county, the rugosities were not so prominent, giving place to concentric scales; nor was the silken lustre of the epidermis so obvious. In these latter, too, the color within was more uniformly of a bluish purple.

ALASMODON MARGINATA.

PLATE XIV. FIG. 225.

(STATE COLLECTION.)

Alasmodonta marginata. SAY, Nich. Ency. pl. 3, fig. 4.
Monodonta id. ID. Ib. Ed. prior.
A. id. SAY, Journ. Acad. Nat. Sc. Vol. 1, p. 459.
A. id. BARNES, Am. Journ. Sc. Vol. 6, p. 279.
Margaritana marginata. LEA, Trans. Am. Phil. Soc. Vol 6, p. 135.
A. id. GOULD, Invertebrata of Mass. p. 116, fig. 77.

Description. Shell small and thin, oblong, suboval, widely gaping behind. Beaks rather small, but somewhat elevated, with three or four concentric undulations. Hinge-margin

elevated, compressed, carinate: posterior hinge-margin abruptly depressed, with numerous obtuse oblique wrinkles near it; the ridge from the beaks to the posterior margin distinct. Teeth (one in each valve) compressed, slightly elevated, and terminating abruptly behind, sometimes scarcely apparent. Surface with numerous concentric wrinkles behind.

Color. Epidermis olive-green, with numerous darker green interrupted radiations; within, bluish white, with a tinge of buff in the centre.

Vertical axis, 1·0; transverse ditto, 2·0.

This species assumes great variety in shape and coloring, and is supposed by Mr. Lea to be the same shell from the Western States, described by Mr. Say under the name of *A. truncata*. It is found in various parts of this State.

Alasmodon arcuata.

PLATE XIV. FIG. 224.

(STATE COLLECTION.)

Alasmodonta arcuata. Barnes, Am. Journ. Sc. Vol. 6, p. 277, pl. 12, figs. 20 and 21.
Margaritana margaritifera. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 136.
Alasmodon arcuata. Adams, Am. Journ. Sc. Vol. 40. Gould, Invertebrata, p. 114, fig. 75.

Description. Shell thick and strong, subcylindrical, bent, or obscurely kidney-shaped. Hinge-margin elevated, compressed, carinate. Anterior slope declivous, terminating in a narrow somewhat pointed anterior margin. Beaks slightly elevated, very far on one side, often much eroded: hinge-margin and basal margin usually parallel; the latter (in old specimens) much arcuated. Teeth in one valve double, erect, strong, one of them deeply grooved so as to form a slight denticulation on its edge; in the other valve, the tooth is single, long, grooved, and with a pit on each side: a slightly elevated fold in the place of lateral teeth.

Color. Epidermis brownish black, loosely wrinkled towards the margins; in young specimens, smooth: within bluish white, iridescent; margin greenish.

Vertical axis, 2·0 – 2·6; transverse ditto, 4·0 – 5·5.

This is one of the largest and most common of our *Unios*. Mr. Lea has thought proper to consider it as identical with the *Mya margaritifera* of Europe; but as Dr. Gould has shown, that shell is shorter, the beaks more central and elevated, and the interior minutely granulated. My specimens were from Rockland county, Champlain, Oneida, and many other localities.

Alasmodon undulata.

PLATE XV. FIG. 227.

Alasmodonta undulata.		Say, Nich. Encyl. Vol. 4, pl. 3, fig. 3.
A.	*id.*	Id. Journ. Acad. Nat. Sciences, Vol. 1, p. 459.
A.	*id.*	Barnes, Amer. Jour. Science, Vol. 6, p. 279.
Margaritana	*id.*	Lea, Trans. Am. Phil. Soc. Vol. 6, p. 135.
A.	*id.*	Gould, Invertebrata of Mass. p. 115, fig. 76.

Description. Shell moderately thin, much inflated, dilated and then attenuated in front, regularly rounded behind, widely gaping. Beaks prominent, contiguous, often decorticated, with four or five large obtuse distant concentric undulations; these are, however, sometimes indistinct: basal margin regularly curved. Surface much undulated by the incremental lines. Hinge supported on a very strong rib. Tooth in the right valve double, crenate; the anterior erect, prominent, conical: in the other valve, the tooth is occasionally bifid.

Color. Epidermis green or olivaceous, with numerous dark green radiations of unequal breadth: within salmon-colored and bluish white; iridescent on the anterior portion.

Vertical axis, 1·0 – 1·3; transverse ditto, 1·8 – 2·2.

Found at Norman's kill in Albany county, Champlain, &c.

Alasmodon corrugata.

PLATE XXIV. FIG. 259.

(CAB. LYCEUM NAT. HIST.)

Description. Shell thin, ovate, rather tumid, not gaping. Beaks prominent, often eroded, with one or two undulations. Ridge from the beaks posteriorly rounded, but prominent, and forming a distinct area: within this area is another, bounded by two lines forming an ellipsis; from the anterior portion of this line, but reaching the ridge as we proceed posteriorly, arise from fourteen to sixteen rounded elevated ridges, running obliquely upwards and backwards, and strongly impressed on the inner surface. Tooth in one valve prominent, trifid; in the other, but slightly elevated and indistinct. Cavity of the beaks large and capacious.

Color. Epidermis shining olive-green, and produced on the sides beyond the margin, olive-brown on the beaks; valves with faint radiating striæ of a darker green, more distinct towards the basal margin: within, violet in the cavity of the beaks, chalky on the margin.

Vertical axis, 1·0; transverse ditto, 1·8. Diameter, 0·75.

I am indebted for this beautiful species to Mr. I. Cozzens, who obtained it from the Passaic and its tributaries originating in the State of New-York. In many particulars it is allied to *A. marginata;* but the closed shell and trifid tooth, together with other obvious differences, would seem to indicate the propriety of considering it as a new species.

GENUS ANODON. *Bruguières.*

Animal as in the two preceding genera. *Shell* generally thin; hinge toothless; all the other characters of the two preceding genera.

ANODON UNADILLA.

PLATE XV. FIG. 228.

(CABINET OF DR. BUDD.)

Description of the adult shell, solid, concentrically rugose, (more particularly on the posterior portion), transversely subelliptical, kidney-shaped, inflated, inequilateral. Beaks large, elevated, contiguous, very prominent, anterior to the centre of the shell: greatest diameter near the centre of the shell. Hinge-margin slightly arched, nearly straight: upper posterior margin sloping to the regularly rounded posterior margin; basal margin widely arcuated and compressed on the side; anterior margin broadly and regularly rounded. Within, the cavity is capacious; in the beaks, deep and wide, with a crescent-shaped deep cicatrix far within: palleal impression very distinct. Anterior cicatrices confluent; posterior distinct, the upper very small, and placed immediately under the end of the hinge-ligament; dorsal cicatrices five, very conspicuous, small, and arranged in a regular series anterior to the cavity of the beak.

Color. Epidermis dark brown, passing into dark olive green on the basal margin; beaks yellowish brown: within, salmon-color, brightest within the limits of the palleal impression; margin bluish white.

Vertical axis, 2·0; transverse ditto, 3·5. Diameter, 1·5.

This species is an exception to the old generic character, as it is remarkably stout and solid. It was obtained by Dr. C. H. Stillman, from Unadilla river, Otsego county, a tributary of the Susquehannah. In its general outline it resembles *A. cylindracea* of Lea, but is at once distinguished by its solidity and greater inflation, and the situation and prominence of its beaks; the palleal impression, in our specimens, may be traced through the posterior cicatrices. In the smaller specimens, the beaks are distinctly undulated; the epidermis is darker, and the nacre is of a deeper salmon-color: the palleal impression in all may be traced through the posterior muscular impressions.

Anodon subcylindracea.

PLATE XVI. FIG. 229.

Anodon subcylindracea. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 106, pl. 24, fig. 117.

Description. Shell moderately small, elliptical, rounded at both ends, nearly cylindrical, very inequilateral. Ligaments elevated: substance of the shell usually thin, but occasionally solid. Beaks somewhat prominent, and minutely undulated at the tip; basal margin very slightly contracted. Anterior and posterior cicatrices confluent; dorsal cicatrices not perceptible. Shell deep: cavity of the beaks shallow.

Color. Epidermis deep brown, lighter towards the beaks, and without rays; within, bluish iridescent.

Vertical axis, 1·1; transverse ditto, 2·2.

I am indebted to Dr. Boyd for this species, which was obtained by him at Oak-orchard creek, Orleans county, in 1837. I then had indicated it as probably a new species, but as I find it published by Mr. Lea, have adopted his name. It occurs also in the Oswego river.

Anodon ferussaciana.

PLATE XVI. FIG. 230.

Anodonta ferussaciana. Lea, Trans. Am. Phil. Soc. Vol. 5, p. 45, pl. 6, fig. 15.
Margarita (Anodonta) id. id. Ib. Vol. 6, p. 138.

Description. Shell thin, subcylindrical, inequilateral, inflated, pointed at one extremity. Dorsal margin curved immediately under the point of the beak; basal margin regularly curved: ligament rather short and thin. Beaks somewhat prominent, often decorticated, with two or three small undulations at the tip.

Color. Epidermis olive-green, with concentric shades of light green and obscure rays of the same: within bluish white, iridescent; tinged with salmon color under the beaks.

Vertical axis, 1·4; transverse ditto, 2·35.

This delicate and beautiful shell was also communicated to me by Dr. Boyd, as a supposed new species. It was obtained by that gentleman from the Erie canal, near Coldspring. It was first described by Mr. Lea, from the River Ohio. The New-York specimens appear to be of a lighter hue.

Anodon edentula.

PLATE XVI. FIG. 231.

(STATE COLLECTION.)

Alasmodonta edentula. Say, according to Lea.
Margarita (Anodonta) id. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 136.
Anodon areolatus. Swainson, Zool. Illustrations, 2d series, pl. 1.

Description. Shell moderately thin, inequilateral, subcompressed, regularly rounded at one extremity and subangular at the other: dorsal margin nearly straight. Beaks prominent, contiguous, often decorticated, strongly rugose. Basal margin not regularly rounded: a slightly emarginate prominence supplying the place of a tooth in one valve.

Color. Epidermis light brown, with indistinct traces of radiation: within, salmon-color near the beaks; bluish white and faintly iridescent towards the margins.

Vertical axis, 1·0; transverse ditto, 1·7. Diameter, 0·7.

I am scarcely satisfied with the propriety of separating this from *Alasmodon*, and unfortunately I have but one specimen, obtained from Lake Onondaga. Mr. Say's description I have not met with.

Anodon plana.

PLATE XVII. FIG. 232.

(STATE COLLECTION.)

Anodonta plana. Lea, Trans. Am. Phil. Soc. Vol. 5, p. 48, pl. 7, fig. 18.

Description. Shell large, solid, inequilateral, inflated, elliptical, produced and attenuated in front: ligament external, elevated. Beaks large and prominent, often eroded. Surface concentrically rugose, almost scaly on the smaller end: cavity within large and deep. Cicatrices distinct.

Color. Epidermis dark brown, occasionally light green: within bluish white and purple, iridescent; often a light salmon-colored tinge in the centre.

Vertical axis, 2.7; transverse ditto, 4·5. Diameter, 1·7.

The specimens which furnished this description came from Port bay, Lake Ontario. Through the attention of Mr. I. Cozzens, I have examined forty or fifty specimens of this species from Ohio; these are generally much larger, more inflated, with thicker valves, and the alation more conspicuous. I should be disposed to consider our New-York specimens as very strongly marked varieties of this species.

Anodon excurvata.

PLATE XVII. FIG. 233.

(STATE COLLECTION.)

Description. Shell thin and fragile, transversely oblong, inflated, cylindrical. Beaks slightly before the anterior third of the shell, prominent, decorticated (in young shells with two or three distant undulations), the greatest thickness at the middle of the shell. Hinge-margin short, straight, forming a descending slope posteriorly, broadly emarginate beyond; this is more obvious in the younger shells, in which the hinge-slope is more elevated: the ridge from the beaks distinct and rounded, including two concentric elevations on each side; the posterior end produced, obtusely pointed, upturned: basal margin, in adults, slightly contracted in the middle. Surface deeply corrugated by the lines of growth, and these corrugations are distinctly marked within.

Color. Epidermis varying from light grass-green in the young, to deeper green and olivaceous in the adult, with narrow obscure greenish radiations, often minutely wrinkled: interior bluish iridescent, with a faint tinge in some of salmon towards the cavity of the beaks. In adults, the interior is strongly impressed by some of the stages of growth.

Vertical axis, 2.7; transverse ditto, 5·5. Diameter, 2·1.

This superb *Anodon* was found by Dr. W. Newcomb in Shaker pond, Niskayuna, Albany county, and by Mr. Cozzens in the Passaic river in the neighborhood of this city. Its size, almost cylindrical shape, with its peculiar upturned posterior extremity, could not be reconciled to any of the descriptions accessible to me. It seems most allied to the *implicata* of Say, but the description and figure do not apply to this. The young are not so much inflated. In one whose transverse axis was 2·4, the vertical axis was 1·2, and the diameter only 0·8. In the collection of Dr. Budd, are specimens from Lake Champlain, which I refer to this species; in the greater part of these, the beaks and the ridge to the posterior margin of the shell are of an orange, or rather of a mahogany color, which is more or less diffused over the shell.

Anodon implicata.

Anodonta implicata. Say, Des. terr. & fluv. Shells, p. 11. Russel, Essex Jour. Vol. 1, p. 60.
A. newtoniensis. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 79, pl. 21, fig. 66, fide Gould.
A. marginata (young). Say, Nich. Ency. Vol. 4, pl. 3, fig. 5.
A. implicata. Gould, Invertebrata of Mass. p. 118, fig. 78.

Description. Shell thick, strong and heavy, subcylindrical, suboval. Beaks somewhat elevated at the anterior two-fifths; breadth greatest behind the middle: ridge from the beaks to the posterior margin very distinct and prominent; the margin itself bluntly rounded, not upturned: in the space above this, are three or four coarse concentric lines; basal margin deeply arched, and contracted in large specimens. Surface roughened by the irregular stages of growth.

Color. Epidermis greenish yellow in the adults; green in the young, which are also very faintly rayed: within silvery or salmon-colored; in some specimens, reddish.

Vertical axis, 2·0; transverse ditto, 4·0. Diameter, 1·0.

This shell appears to be common in various parts of this State and the adjoining States. If it be, as Dr. Gould suggests, the *A. newtoniensis* of Lea, it has a wide southern range. Say remarks, on *implicata*, that it is more cylindrically convex than any he ever met with.

Anodon fluviatilis.

PLATE XVIII. FIG. 234.

Mytilus fluviatilis. Dillwyn, Catalogue, Vol. 1.
Anodonta cataracta. Say, Nich. Ency. Vol. 4, pl. 3, fig. 4. Russel, Essex Jour. Vol. 1, p. 69.
Anodonta fluviatilis. Lea, Trans. Am. Phil. Soc. Vol. 6, p. 138.
A. cataracta. Adams, Am. Jour. Sciences, Vol. 40, p. 276.
A. fluviatilis. Gould, Invertebrata of Mass. p. 117, fig. 80.

Description. Shell thin, fragile, inequilateral, oblong, inflated; its greatest vertical axis is from the posterior end of the ligament. Beaks at the anterior third of the shell, prominent, swelling, often undulated at the tip. Basal margin slightly gaping: an indistinct ridge or double fold extends from the beaks to the posterior margin. The hinge-margin, at its posterior portion, compressed, and raised into a thin crest. Surface with concentric striæ, which become almost scaly folds behind.

Color. Epidermis light green or olive, with a few short indistinct radiations; beaks horn-color: interior bluish white, iridescent.

Vertical axis, 2·5; transverse ditto, 4·5. Diameter, 1·5.

This species is common in almost all our mill-ponds and sluggish streams.

Anodon pavonia.

PLATE XL. FIG. 358.

(STATE COLLECTION.)

Anodonta pavonia. Lea, Tr. Am. Phil. Soc. Vol. 6, p. 21, fig. 65.

Description. Shell moderately thin, inflated, transversely oblong, regularly rounded in front, subacutely rounded behind: umbones large. Beak distinct, flattened above, undulated, incurved, contiguous, with a slight pit in front; basal margin regularly rounded. Surface smooth and polished, with slight concentric furrows of growth; within, with faint radiating striæ.

Color. Light grass-green, with darker green waving radiating striæ on every part of the shell; beaks uniform olive brown: within bluish white, iridescent.

Vertical axis, 1·8; transverse ditto, 3·2. Diameter, 1·2.

The characters of this large and beautiful species, first described and named by Mr. Lea, appear to apply exactly to specimens derived from Onondaga lake, and for which I am indebted to Dr. Sartwell.

Anodon benedictensis.

PLATE XVIII. FIG. 235.

(STATE COLLECTION.)

Symphonota benedictensis. Lea, Trans. Am. Phil. Soc. Vol. 5, p. 104, pl. 16, fig. 48.
Anodonta id. Adams, Am. Jour. Sciences, Vol. 40, p, 276,

Description. Shell thin and fragile, trapezoidal, inequilateral, subcompressed: dorsal margin nearly straight. Beaks somewhat prominent, and granulate at tip; in perfect specimens, with four to five distinct undulations. Cicatrices scarcely perceptible.

Color. Epidermis light brownish horn, verging to greenish; the incremental lines somewhat darker: within bluish white, slightly iridescent.

Vertical axis, 1·5 – 2·3; transverse ditto, 3·0 – 4·2. Diameter, 1·0 – 1·4.

From Lake Champlain, and Onondaga lake. In a general revision of this family, it is highly probable that this will be considered as a variety of the preceding. In all the specimens which I have seen, one end is covered with a loose earthy coating. It may be observed, too, that they are rather inflated than subcompressed.

FAMILY CARDIDÆ.

Animal *as in the preceding. Inhabiting salt water.* Shell *heart-shaped. Cardinal teeth two or three; lateral teeth one or two. Epidermis often scanty or wanting; not iridescent within.*

GENUS CARDITA. *Bruguières.*

Shell equivalve, thick, inequilateral, suborbicular, ribbed. Hinge with a short strong erect tooth under the beaks, and an oblique elongated one along the margin. Epidermis distinct.

Cardita borealis.

PLATE XXII. FIG. 247.

(STATE COLLECTION.)

Venericardia cribraria? Say.
Cardita borealis. Conrad, Am. Mar. Conch. p 38, pl. 8, fig. 1.
C. id. Gould, Invertebrata of Mass. p. 94, fig. 59.

Description. Shell very thick and robust, suborbicular, heart-shaped. Beaks elevated and recurved: from eighteen to twenty radiating ribs, broader than their distances apart, and strongly crenating the outer margin: ligament nearly concealed; lunule deeply impressed.

A small triangular tooth in the left valve, with a long grooved and oblique one along the margin; in the other valve, a long oblique tooth, occupying the pit between the teeth of the left valve, and a smaller one near or upon the ligament.

Color, white, under a thick blackish brown epidermis.

Vertical axis, 1·0; transverse ditto, 1·1. Diameter, 0·8.

This occurs along all the shores of Long island, and even extends to the Arctic seas.

I suspect that Mr. Say had this species before him when he described his *Venericardia cribraria*, which may be found on the cover of No. 5 of his *Conchology*, with the following characters: "Longitudinally ovate, orbicular, with twenty slightly elevated ribs, more distant from each other than their width, decussated by concentric almost equally elevated lines. Length, 1·2; breadth, 1·1. *New-Jersey.*"

(*EXTRA-LIMITAL.*)

C. incrassata. (Conrad, loc. cit. p. 39, pl. 8, fig, 2.) Shell oblong, oblique: ribs about eighteen, crenulated anteriorly. *Color*, light yellow, with fulvous or brown spots. *Florida.*

C. tridentata. (Say, Am. Conch. pl. 40, fig. 1 – 5. Venericardia *id.* Ac. Sc. Vol. 5, p. 216.) Shell suborbicular, subequilateral, thick and ponderous, with about eighteen convex ribs, cancellate; obsolete on the umbo and anterior side. Inner margin deeply crenate: hinge with two diverging teeth in valve, one separated by a large cavity; on the other, a large prominent recurved tooth closing into the cavity. Length, 0·25. *South-Carolina.*

GENUS CARDIUM. *Linnæus.*

Shell more or less heart-shaped: beaks prominent; margin generally toothed or folded within; hinge with two oblique cardinal and two lateral teeth in each valve; palleal impression without a sinus.

Cardium pinnatulum.

PLATE XXII. FIG. 249.

(STATE COLLECTION.)

Cardium pinnatulum. Conrad, Jour. Ac. Sciences, Vol. 6, p. 260, pl. 11, fig. 8.
C. id. Gould, Invertebrata of Massachusetts, p. 90, fig. 57.

Description. Shell small, thin and fragile, nearly orbicular. Ribs about twenty-six, flattened, but becoming convex towards the base, with a series of equidistant scales almost assuming behind the appearance of spines: beaks slightly elevated, often decorticated, inclining inwards.

Color. Dingy white without; within dull white.

Length, 0·45. Width, 0·5. Diameter, 0·3.

A small shell, found, but not common, only along the shores of Long island sound.

Cardium islandicum.

PLATE XXIII. FIG. 252. Young.

Cardium islandicum. Linn. Syst. Nat. p. 1124.
C. pubescens. Couthouy, Bost. Jour. Vol. 2, p. 60, pl. 3, fig. 6 (young).
C. islandicum. Gould, Invertebrata of Massachusetts, p. 89, fig. 58.

Description. Shell large and rather thin, rounded, inflated, nearly equilateral. Beaks prominent, incurved, contiguous: anterior dorsal area feebly impressed, subcordate. Surface with thirty-six to thirty-eight sharp ribs, which are covered with a stiff fringe-like epidermis in the young shells. Margin of the shell crenate internally, and the surface impressed by the ribs.

Color. Epidermis dull yellowish brown; within, straw-colored, or brilliant yellow in the young.

Length, 1·0 – 2·5. Width, 0·9 – 2·3. Diameter, 0·9 – 1·0.

This shell occurs from Cape Cod, near which it is obtained plentifully from the stomachs of fishes, along the coast of Maine, where it is found on the shores, to the Arctic circle, and on both sides of the Atlantic.

Cardium grœnlandicum.

PLATE XXIII. FIG. 250.

(STATE COLLECTION.)

Cardium grœnlandicum. Gmelin, Syst. Nat. p. 3232.
Aphrodita columba. Lea, Trans. Am. Phil. Soc. Vol. 5, p. 110, pl. 18, fig. 54.
Cardium grœnlandicum. Gould, Invertebrata of Mass. p. 92.

Description. Shell large; the adult very thick and robust, heart-shaped, somewhat compressed. Beaks submedial, prominent, incurved, contiguous. Surface with concentric incremental lines, crossed by numerous almost obsolete elevated radiating lines. Hinge ligament small: margin entire, gaping behind. Cardinal teeth almost obsolete; lateral teeth small and distinct.

Color. Epidermis thin, pale olivaceous or drab: the young with occasionally zigzag darker lines; beneath this, dingy white. Interior opake white, flesh or salmon-colored.

Length, 1·5 – 2·3. Width, 1·6 – 2·7. Diameter, 1·3.

This shell has not yet been found south of the shores of Maine, except in the stomachs of fishes. It has much the external configuration of a *Mactra*, for which it has been mistaken; and the occasional absence of the cardinal teeth has led Mr. Lea to arrange it under a new genus.

Cardium mortoni.

PLATE XXIII. FIG 251.

(STATE COLLECTION.)

Cardium mortoni. Conrad, Jour. Acad Nat. Sc. Vol. 6, p. 259, pl. 11, figs. 5, 6, 7.
C. id. Gould, Invertebrata of Mass. p. 91.

Description. Shell small, thin, inflated, globular, slightly oblique. Surface smooth and destitute of ribs or rays: posterior side somewhat obliquely extended; margin entire, or obsoletely serrated; beaks large, tumid, subcentral, contiguous.

Color. Epidermis scanty, dingy-white; beneath which it is yellowish, the beaks yellow: an oblong dark purple spot on the posterior side. Interior with faint radiating striæ: the cavity bright sulphur yellow; margins white.

Length and breadth, 0·5 – 0·9. Diameter, 0·3 – 0·6.

This is a very common shell along the shores of Long island sound. It is closely allied to the *C. lævigatum* of the Antilles, according to Dr. Gould, but wants the purple blotch on th posterior margin, and is more smooth and polished on its surface.

(*EXTRA-LIMITAL.*)

C. fasciatum. (Montagu, Suppl. 30, pl. 27, fig. 6.) Shell ovate-rotund, pellucid. Valves with about 27 longitudinal ribs, and a few distant elevated striæ, which are often obsolete towards the hinge. *Color,* whitish, with transverse interrupted brown bands, which appear, especially within, like series of oblong spots. Length, 0·25; width, 0·4. *Common to both Continents.*

C. muricatum. (Lin. p. 1123. Lam. Vol. 3, p. 626.) Shell ovate, heart-shaped. Valves with 36 ribs, of which 12 have their spines directed in an opposite direction to the others; marginal serratures largest on the anterior edge. *Color,* greyish or yellowish white, edged with orange-yellow or scarlet on the anterior side, and sometimes stained with red. Length, 1·5; width, 1·4; diameter, 1·0. *South Carolina, Florida.*

C. ventricosum, Brug. (Lam. Vol. 3, p. 627.) Shell ventricose, almost heart-shaped. 33 – 34 ribs, of which seven at the anterior end are flattened and somewhat imbricated, and a few at the posterior end are without the scaly striæ which cross the others; one edge of the middle ribs is more rounded than the other, and they all form crenatures on the margin of the shell. *Color,* rusty spotted, and irregularly banded transversely with brown. Length, 2·2 – 4·5: width, 2·0 – 4·0; diameter, 1·7 – 3·5. *South Carolina.*

FAMILY CHAMIDÆ.

ANIMAL *with the mantle opened beneath, merely for the passage of the foot; the edges adherent and minutely fringed, united behind by a transverse band, pierced by two orifices, one for breathing and the other for the excretions. Marine or fresh water.* SHELL *often attached: lateral teeth on the posterior side only; cardinal teeth variable.*

Genus CHAMA, *Linn.* Shell irregular, attached by the lower valve; a single lengthened tooth in one valve, and a corresponding groove in the other.

C. arcinella. (LAM. Vol. 3, p. 683.) Shell subcordate, with the ribs armed with very long spines; the spaces between punctated: posterior area large, heart-shaped and verrucose; margin crenulated. *Color*, white, occasionally tinged with rose-red; within, yellowish. Length, 1·5; width, 1·8. *Florida.*

SECTION 3. CONCHIFERA.

ANIMAL *with the mantle closed: one opening beneath and in front, for the passage of the foot, and in the rear exhibiting two extensible, more or less elongated tubes, united or distinct; one beneath for respiration, and the other above for the excrementitious dejections.* SHELL *subcordiform, equivalve, with radiated sides: hinge of four teeth in each valve; ligament very short.*

FAMILY TELLINIDÆ.

Not more than two cardinal teeth on the same valve. Nymphæ in general externally prominent, and covered by a ligament.

GENUS TELLINA. *Lamarck.*

Mantle bordered with tentacular appendages. Gills unequal on each side. Foot much compressed, trenchant, and pointed in front. Tubes much elongated, distinct, and entering into a fold of the mantle. *Shell* transverse, subequivalve, compressed, angular and somewhat rostrated at the posterior end, where there is an irregular wave-like fold: two small cardinal teeth, and generally two lateral teeth in each valve.

Tellina tenera.

PLATE XXVI. FIG. 271.

(STATE COLLECTION.)

Tellina tenera. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 303.
T. id. Gould, Invertebrata of Mass. p. 68, fig. 44.

Description. Shell very thin and fragile, pellucid, compressed, transversely oblong, suboval. Surface with delicate concentric wrinkles, caused by the lines of growth. Beaks placed slightly anteriorly: marginal folds distinct; basal margin slightly arcuated. The anterior cardinal tooth in the left valve largest; the other often indistinct; the chief tooth in each valve grooved: lateral tooth on the longest side distinct; the others very indistinct.

Color. White, iridescent, occasionally with a pinkish or rosaceous hue.

Vertical axis, 0·35; transverse ditto, 0·55. Diameter, 0·1.

This beautiful little shell occurs on our coast, from the shores of New-Jersey northwardly. On the coast of Massachusetts, it is very common.

Tellina versicolor.

PLATE XXVI. FIG. 172.

T. versicolor. Cozzens, Jay's Catalogue of Shells, Ed. alt. p. 15.

Description. Shell transverse, compressed, inequilateral, equivalve, slightly gaping at its subacute extremity. Incremental striæ evident, but not laminæ, and no radiating striæ: the posterior end subangular, with an indistinct fold; anterior extremity dilated and rounded. Cardinal teeth two in the right valve; the posterior more robust, simple: in the left valve, rudimentary or inconspicuous.

Color. Polished, opalescent, white, with a distinct purple and bluish iridescence, often strongly radiated, enlarging towards the margins.

Vertical axis, 0·4; transverse ditto, 0·65. Diameter, 0·2.

This shell, which is of extreme beauty, and often very brilliant, was first detected by Mr. I. Cozzens on the shores of the Hudson at Glass-house point, a few miles above the city. In its comparative proportions, teeth and color, it varies distinctly from *T. sordida*, with which it is otherwise allied. It resembles very much the description of *T. iris*, except in wanting the oblique striæ; but I have had no opportunity of making a direct comparison of the shells.

Tellina tenta.

Tellina tenta. Say, American Conchology, pl. 65, fig. 3.
T. id. Adams, Bost Journ. Nat. Hist. Vol. 3, p. 332.
T. id. Gould, Invertebrata of Mass. p. 68, fig. 43.

Description. Shell small, thin, oval, deflected by the folds to the right. Valves widely gaping, very convex; the left one more so: margin subtruncate behind; beaks prominent. Surface minutely wrinkled by the lines of growth, with a few fine radiating lines across the middle. Two diverging cardinal teeth in the right valve, and a single one in the left; a posterior lateral tooth on the right valve, and a corresponding groove in the left.

Color, white; the epidermis soiled white: interior, white tinged with yellow, and with faint impressed radiating lines, producing a minutely indented margin.

Vertical axis, 0·4; transverse ditto, 0·6. Diameter, 0·2.

Although this shell has been found on the shores of South-Carolina and Massachusetts, yet I have not been able to obtain it along the seacoast of New-York, where it undoubtedly exists. Its distinctive character consists in its flexed valves widely gaping behind, and in its internal radiations.

(*EXTRA-LIMITAL.*)

T. lateralis. (Say, Ac. Sc. Vol. 5, p. 218.) Shell transversely subovate; beak nearly central. Posterior margin regularly rounded; anterior margin rostrated, the beak turning to the left and slightly gaping; ligament-slope straight: basal margin regularly arcuated, a little contracted near the beak. Valves with small concentric wrinkles and slight waves; within, these are slightly impressed. Lateral teeth none; cardinal teeth two in one valve, and one with another scarcely elevated filiform tooth in the other. *Color*, whitish, often tinged with rusty; within white. Length, 1·5; width, 2·1. *Seacoast.*

T. polita. (Id. Ib. Vol 2, p. 276; Ess. Jour. Vol. 1, p. 56.) Shell transversely subtriangular, with minute concentric wrinkles: anterior margin rather shortest; hinge-slope declining in a very slightly arcuated line to a subacute termination; basal margin nearly straight from behind the middle to the anterior end; a lateral tooth behind the primary one. *Color*, white, immaculate. Length, 0·4; breadth, 0·6. *Southern Coast.*

T. iris. (Id. Ib. Vol. 2, p. 302.) Shell very thin and fragile, pellucid, compressed, transversely oblong, suboval: minute concentric wrinkles, crossed by oblique striæ which do not attain the margin: margin narrowed and subacute; basal edge straight, opposite the beaks. *Color*, white, iridescent, with a rosaceous disk and one or two anterior rays. Length, 0·3; breadth, 0·5. *Southern Coast.*

T. flexuosa. Id. Ib. Vol. 2, p. 303.) Shell suborbicular: anterior margin longer than the posterior, and less obtusely rounded; beaks behind the middle, not prominent; surface with regular parallel oblique impressed lines, refracted and infracted 4 – 5 times alternately on the anterior margin; no longitudinal striæ; transverse wrinkles very minute. *Color*, white. Length, 0·45; breadth, 0·6. *Southern coast.*

T. interstriata. (Id. Ib. Vol. 5, p. 218.) Subovate, angulated at the anterior base, transversely wrinkled and slightly striated within longitudinally: hinge teeth very small; no lateral teeth. *Color*, white, immaculate. Length, 1·6; breadth, 2·1. *East-Florida.*

T. alternata. (Id. Ib. Vol. 2, p. 275.) Shell compressed, oblong, narrow and angulated before: numerous impressed concentric lines, alternately obsolete, on the anterior margin. Within, a callous line passes from behind the hinge to the inner margin of the anterior cicatrix. Anterior hinge-tooth emarginate; posterior lamellar tooth near the cardinal, so as to appear like a primary tooth; that of the right valve wanting: anterior lamellar tooth at the extremity of the ligament. Anterior hinge-slope declining in a concave line to an obliquely truncated tip. *Color*, white, tinged with yellow within. Length, 1·25; width, 2·2. *Georgia and East-Florida.*

T. decora. (Id. Ib. Vol. 5, p. 219.) Transversely subovate, not much compressed, with numerous minute concentric wrinkles and regular equidistant lines crossing them: no oblique lines on the anterior margin. Posterior lateral tooth of the left valve prominent; the others obsolete: apex a little before the middle. *Color*, rosaceous or white, with rosaceous radiations. Length, 8·5; breadth. 0·8. *East-Florida.*

T. mera. (Id. Am. Conch.)

GENUS DONAX. *Linnæus.*

Animal with large labial appendages: mouth small. Foot compressed, trenchant, angular. Tubes or siphons elongated, slender and separate, entering into a fold of the mantle. *Shell* transverse, equivalve, inequilateral, trigonal: two primary teeth in one or both valves, and one or two lateral teeth more or less apart. Ligament short, external.

Donax fossor.

PLATE XXIII. FIG. 255.

(STATE COLLECTION.)

Donax fossor. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 306.

Description. Shell subtriangular; anterior margin short and rounded. Posterior hinge-slope straight; the base very slightly prominent beyond a regular curve at the middle. Surface striated with numerous equal parallel lines, not visible to the naked eye, and obsolete on the posterior margin; the basal margin crenate within.

Color. Pale livid, with two longitudinal rays both within and without.

Length, 0·43; width, 0·5.

This pretty little shell, which is moderately abundant at the south, is not uncommon on our coast, but does not seem to extend northwardly. It buries itself in the sand, and affords a supply of food to birds and fishes.

(*EXTRA-LIMITAL.*)

D. variabilis. (Say, l. c. Vol. 2, p. 305.) Shell triangular: anterior margin obliquely truncated, cordate; suture a little convex; posterior hinge-margin nearly straight; base a little prominent beyond a regular curve near the middle. Valves striated longitudinally with scarcely visible parallel impressed lines; basal edge crenate. Length, 0·5; width 0·9. *Georgia and Florida.*

D. elevata? (Haldeman, Monog. Lymn.) Shell orbicular: cardinal tooth prominent; lamellar tooth thick; beaks elevated. *Color*, brownish olive. Length, 0·55; height, 0·5. *New-Orleans.*

Genus Capsa, *Brug.* Shell transverse, equivalve. Valves approximated and close; right valve with three primary teeth; a small bifid tooth in the left valve, inserted into a cavity in the opposite one; no lateral teeth: ligament external.

C. lævigata. (Conrad, Conch. pl. 17. Pl. 25, fig. 260 of this book.) Shell oblong, trigonal, convex, with minute radiating striæ: posterior side compressed; lateral margin flattened; beaks prominent. *Color:* epidermis pale olive; beaks violaceous: interior bluish white. Transverse axis, 2·2; vertical ditto, 1·5. *Florida.*

C. deflorata. (Id. l. c. p. 70, pl. 17, fig. 1.) Shell small, ovate-oblong, convex, with numerous rugose radiating striæ, strongest on the posterior margin, where they are somewhat tuberculated. *Color*, variable, but generally violaceous, with broad yellowish rays. *Florida.*

GENUS SANGUINOLARIA. *Lamarck.*

Animal unknown. *Shell* equivalve, inequilateral, subovate, compressed, rounded anteriorly, subrostrate posteriorly, slightly gaping at the sides. Hinge-margin with two small cardinal approximated teeth in each valve: palleal impression with a deep sinus.

Sanguinolaria fusca.

PLATE XXXII. FIG. 304.

(STATE COLLECTION.)

Psammobia fusca. Say, Jour. Acad. Nat. Sciences, Vol. 5, p. 219.
P. *id.* Russel, Essex Jour. Nat. Hist. Vol. 1, p. 54.
Sanguinolaria fusca. Conrad, Am. Mar. Conch. p. 34, pl. 7, fig. 1.
S. *id.* Gould, Invertebrata of Mass. p. 66, fig. 42.

Description. Shell thin and fragile, ovate-orbicular; beaks small almost central. Surface with concentric wrinkles: anterior margin more narrowed than the posterior, with a slight and obtuse fold passing over the anterior submargin. Teeth slightly diverging, very slender; the largest grooved.

Color. Epidermis dusky; beneath which, brownish tinged with red.

Vertical axis, 0·8; transverse ditto, 1·0. Diameter, 0·3.

This is a very common shell along our shores, and appears to exist from Maine to Florida. It affords a plentiful supply of food to the numerous wild fowl which visit the shores of Long island. There appears to be several varieties in the colors and marking. The young are very small and thin; the teeth not developed, polished white; others are larger, roundish, and of a delicate pink within and without: there are still others larger and proportionally wider, tinged with red or brown when decorticated.

Sanguinolaria sordida.

PLATE XXXII. FIG. 305.

(STATE COLLECTION.)

Tellina sordida. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 59, pl. 3, fig. 11.
S. sordida. Gould, Invertebrata of Mass. p. 67.

Description. Shell thin and fragile, inequilateral, obscurely triangular, slightly gaping. Epidermis thin and brittle; beneath which the surface is marked with numerous incremental lines. Beaks very small, and behind them the margin slopes away in nearly a straight line. Teeth two in each valve; the largest bifid.

Color. Epidermis dusky brown; surface iridescent: within polished white, with faint radiating striæ.

Vertical axis, 0·2; transverse ditto, 0.3.

They are said to occur nearly an inch in their greatest length; the largest I have seen did not exceed 0·5. These latter were procured by Mr. Charles Wheatley, in dredging in the mud in five fathom water off the Quarantine ground. Those described by Messrs. Couthouy and Gould, were exclusively from the stomachs of fishes.

(*EXTRA-LIMITAL.*)

S. lusoria. (*Psammobia?* Say, Ac. Sc. Vol. 2, p. 304. Conrad, Mar. Conch. pl. 7, fig.) Shell oblong, suboval, with minute wrinkles; posterior side narrowed, and inclining to the right at the end: an obtuse convex line on the left valve. *Color:* epidermis pale; beneath, bluish white. Vertical axis, 0·6; transverse ditto, 1·0. *New-Jersey to Florida.*

S. rugosa. (Lam. Vol. 2, p. 558, Ed. Brux.) Ovate, ventricose, longitudinally rugose. *Color,* violaceous behind; nymphæ blackish, violaceous: posterior area none. *Florida.*

GENUS LUCINA. *Bruguières.*

Animal with the edges of its mantle delicately fringed. Tubes short and united, entering into a fold of the mantle. Foot cylindrical, elongated. *Shell* rounded; beaks small. Two diverging cardinal teeth, one of which is bifid; occasionally two distinct lateral teeth in each valve. Palleal impression without a sinus. Ligament posterior and elongate.

LUCINA DIVARICATA.

PLATE XXVI. FIG. 273.

(STATE COLLECTION.)

Tellina divaricata. LIN, Syst. Nat. p. 1120.
Strigi la id. TURT. Test. Brit. p. 119.
Lucina id. LAM. Am. sans vert. p. 575. GOULD, Invertebrata of Mass. p. 70.

Description. Shell thin, orbicular, equilateral: beaks small, prominent, inclined forwards; basal margin regularly rounded and crenate. Surface with well marked concentric lines, crossed by deep oblique lines passing towards both ends, and giving a beautiful reticulated appearance. Cardinal teeth minute; one in the right valve very small, and two small diverging ones in the left: lateral teeth often wanting.

Color. Dingy white, occasionally with a reddish tinge.

Vertical axis, 1·0; transverse ditto, 0·7. Diameter, 0·5.

This shell occurs throughout the whole seacoast of the United States. It is a remarkable distinct species, and occurs also on the shores of Europe.

(*EXTRA-LIMITAL.*)

L. radula, Montagu. (COUTHOUY, Bost. Jour. Vol. 2. p. 153. PL. 26, fig. 274 of this book.) Shell thick, convex, with concentric lamellated striæ; on each side of the hinge, a superficial furrow: beaks small, distinct, incurved: no lateral teeth: lumule depressed, lanceolate. *Color:* epidermis whitish brown; beneath opake white. Length, 1·0 – 1·5. *Northern Coast.*

L. contracta. (SAY, Ac. Sc. Vol. 4, p. 145, pl. 10, fig. 8. PL. 27, fig. 275 of this book.) Shell moderately thin, with concentric striæ and intermediate raised lines. Anterior submargin with a very slightly impressed line. Cardinal teeth, one in the left valve and two in the right, of which the posterior is sub-bifid, radiate, striate within towards the margin. *Color*, whitish. Length and breadth, 1·0 – 2·0. Col. Totten found this alive on the coast of Rhode-Island.

L. flexuosa, Mont. (GOULD, l. c. fig. 52.) Shell very minute, globose, triangular: a deep fold along the margin, rendering the base sinuous: a single rudimentary tooth in each valve; within with radiating lines. *Color*, white. Length and width, 0·3; diameter, 0·1. An juv. præced.? Stomachs of fishes. *Northern Coast.*

FAMILY VENERIDÆ.

SHELLS *with three cardinal teeth at least, on one valve; the other having as many or fewer: rarely with lateral teeth; usually solid. Epidermis often scanty or entirely wanting. Tubes elongated, unequal. Foot wide, prominent. Marine.*

OBS. This family corresponds with the *Conques marines* of Lamarck, and comprises at present four genera.

GENUS CYPRINA. *Lamarck.*

Animal with the edges of the mantle undulated, and furnished with a series of tentacular cirri; tubes short, separated. Mouth small; labial appendices small; gills wide; foot wide; compressed, trenchant. *Shell* obliquely heart-shaped, solid; beaks prominent. Hinge with three unequal diverging cardinal teeth, and a remote lateral one; palleal impression simple.

CYPRINA ISLANDICA.

PLATE XXVI. FIG. 269 (ADULT). FIG. 268 (YOUNG).

(STATE COLLECTION.)

Venus	*islandica.*	LIN. Syst. Nat. p. 1131.
Cyprina	*id.*	RUSSEL, Essex Jour. Vol. 1, p. 37.
C.	*id.*	GOULD, Invertebrata of Mass. p. 82.

Description. Shell large, thick and ponderous, ventricose; beaks prominent, incurved, contiguous. Ligament stout and prominent: basal margin simple, rounded. Cardinal teeth stout and diverging: three in each valve, or the largest one bipartite in the right valve; lateral tooth inconspicuous: palleal impression distinct. Epidermis coarse and wrinkled.

Color. Epidermis blackish, becoming olivaceous towards the margin; interior chalky white; faint purple on the margin.

Vertical axis, 2·8; transverse ditto, 3·3. Diameter, 1·4.

It rarely attains a greater size than this specimen, which I derived from Mr. Couthouoy, who obtained it on the northern coast. Although a northern shell, it may possibly be detected on the shores of this State. The young shell (fig. 268), which I obtained from fishes, has numerous minute concentric elevated ridges, becoming obsolete on the highly polished beaks; an obsolete ridge extends from the beaks to the basal margin. It may however prove to be a new species of *Astarte.*

GENUS CYTHEREA. *Lamarck.*

Animal as in *Venus*. *Shell* inequilateral, rounded. Hinge with four primary teeth in one valve, one of which is remote from the others ; three in the other valve : no lateral teeth.

Cytherea convexa.

PLATE XXVII. FIG. 279. A. RIGHT VALVE ; B. LEFT.

(STATE COLLECTION.)

Cytheria convexa. Say, Jour. Acad. Nat. Sciences, Vol. 4, p. 149, pl. 12, fig. 3,
C. *id.* Conrad, Jour. Ac. Nat. Sc. Vol. 6, p. 261.
C. *id.* Gould, Invertebrata of Mass. p. 84, fig. 49.

Description. Shell moderately solid, ventricose, subcordate ; beaks elevated, directed forwards. Anterior lunule heart-shaped, distinctly marked by a simple line. Surface distinctly marked by the stages of growth. In the left valve, the two middle teeth contiguous, divergent ; the one behind these, thin, lamellar ; the anterior, conical, subacute : in the right valve, the posterior bifid. Basal margin smooth within.

Color. Epidermis dingy white ; beneath which opake white.

Vertical axis, 1·4 ; transverse ditto, 1·7. Diameter, 1·0.

This shell occurs from New-Jersey to Maine, and perhaps farther north. It is usually found on muddy bottom, and is popularly known among the fishermen on Long Island as the *Little He-clam.* It was first described as a fossil species from the the tertiary of Maryland, by Mr. Say.

(*EXTRA-LIMITAL.*)

C. occulta. (Say, Ac. Sc. Vol. 2, p. 274) Suborbicular, thick, with numerous obtuse transverse and longitudinal elevated lines, nearer to each other than their own diameters : the latter not visible to the naked eye. Lunule destitute of the longitudinal lines. *Color*, yellowish white, with a few large brown spots ; lunule and ligament slope transversely spotted with reddish brown. Length and breadth, 0·5. Rare. *Southern States.*

C. concentrica. (Lam. Am. sans vert. Vol. 2, p. 601. Ed. Brux. Conrad, Am. Mar. Conch. pl. 12.) Shell orbicular, convex, depressed, subequilateral, with numerouc crowded concentric striæ ; lunule heart-shaped, impressed, smooth ; hinge with a large oblong fosset under the beaks ; muscular impressions very large. *Color :* epidermis brownish yellow, tinged with rusty. *Virginia to Florida.*

C. gigantea. (Lam. Am. sans vert. Vol. 2, p. 597.) Shell large, ovate, smooth, slightly angulated on the anterior side : posterior depression oblong-ovate, a little impressed on its sides and keeled in the middle. Teeth of the hinge compressed. *Color*, pale livid, with numerous bluish longitudinal rays, generally interrupted. Length, 3·25 ; Width, 6·0. *Coast of the Southern States.*

GENUS VENUS. *Linnæus.*

Animal oval, moderately thick, with the edges of the mantle undulated, and furnished with a row of tentacular cirri. Tubes rarely separated. Mouth small, with the labial appendages small. Foot occasionally semilunar, not furrowed beneath. *Shell* solid, inequilateral, subovate; hinge with three diverging cardinal teeth in each valve; ligament external; cordiform depressions beneath the beaks: palleal impression with a sinus.

VENUS MERCENARIA.

PLATE XXVII. FIG. 276.

(STATE COLLECTION.)

Venus mercenaria. LIN. Syst. Nat. 1131. RUSSEL, Ess. Jour. Nat. Hist. Vol. 1, p. 58.
V. id. LAM. ubi supra, Vol. 2, p. 610. GOULD, Invertebrata of Mass. p. 85, fig. 67.

Description. Shell large, solid and ponderous, inequilateral, subcordate; beaks incurved, and projecting forwards and inwards. Anterior area heart-shaped, and bounded by an impressed line. Surface, in the old shells, with numerous coarse grooves and ridges; in the young, with concentric lamellar ridges. Epidermis very slight, and easily detached: ligament stout and prominent; posterior area obsoletely plicate. Basal margin entire, but crenulated within; anterior margin rounded; the posterior more pointed. In the one valve, the anterior tooth is largest and distant from the other two, which are oblique and contiguous; in the other valve, the two anterior teeth are united, forming a simple bifid tooth: this is most striking in aged individuals. The remainder of the hinge is composed of roughened irregular points, interlocking with those of the opposite valve. Muscular impressions deep, and united by the palleal impression, which has an angular sinus near the posterior impression.

Color. Externally varying from brownish white to ash-grey, and, in very old specimens, with a rufous tinge, frequently deep blackish brown; but the color appears to vary with the bottom upon which they live. Within, white, with a deep violet or purple margin.

Vertical axis, 2·0 – 3·5; transverse ditto, 3·0 – 4·5. Diameter, 1·8 – 2·3.

This species is the common *Round Clam*, much prized as an article of food, and so savory in some localities as to be equally valued with the *Oyster*. Its aboriginal name of *Quahog* has now fallen into disuse. It sells in the markets at prices varying from thirty-seven and a half to sixty-two and a half cents the bushel. It abounds in all our bays, a few inches beneath the bottom, from low-water mark to two or six fathom water. If taken from its bed and placed on its side, it can, in the course of a single tide, bury itself six inches beneath the surface.

From the internal purple part of the shell, the colored beads of the aborigines were formerly manufactured, constituting the *seawan* or *wampum*, the specie currency of the natives. Long island was formerly the great mint for the supply of this article, and hence its Mohegan

appellation of *Seawan hackee*, or the Isle of Shells. The natives of this island were compelled to pay an annual tribute in wampum to those living on the mainland.

This species does not appear to extend much farther north than Cape Ann, Massachusetts, and I am not acquainted with its distribution south of Delaware bay.

Venus notata.

PLATE XXVII. FIG. 278.

(STATE COLLECTION.)

Venus notata. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 271.
V. id. Gould, Invertebrata of Mass. p. 86, fig. 67.

Description. Shell orbicular, heart-shaped, smaller than the preceding, and less coarse and solid. Surface shining, almost smooth, with the concentric ridges most prominent on the beaks: posterior margin rounded, not produced. Sinus of the palleal impression not as deep: the crenulations on the base submargined.

Color. Whitish tinged with brown, with reddish zigzag marks; anterior one purplish; within uniform yellowish white.

Vertical axis, 1·7; transverse ditto, 1·8.

This species is considered by some writers as a mere local variety of the preceding, but to me its characters appear sufficiently distinctive. It is occasionally found associated with the *V. mercenaria*, but it is most abundant on the outer bars beyond the sea-beaches of Long island, where the *mercenaria* is seldom found. It is usually smaller than the dimensions given above.

Venus gemma.

PLATE XXVII. FIG. 277.

(STATE COLLECTION.)

Venus gemma. Totten, Am. Jour. Sc. Vol. 26, p. 366, pl. —, fig. 2. Russel, Ess. Jour. Vol. 1, p. 58.
V. id. Gould, Invertebrata of Mass. p. 88, fig. 51.

Description. Shell very small, oval, nearly equilateral, glossy, and with numerous minute concentric furrows. Beaks small, almost central, incurved, separate, generally eroded: no defined anterior area. Teeth divergent; the middle one of each valve triangular, robust; the anterior tooth of the right, and the posterior tooth of the left valve, thin, and not easily distinguished. Inner margin crenulated: palleal impression with an acute-angled sinus.

Color. Anterior portion and basal margin, both within and without, white; the remaining parts reddish purple or amethystine, darkest at the upper and posterior margins.

Vertical axis, 0·1; transverse ditto, 0·15. Diameter, 0·08.

This beautiful little shell, which has been dredged from the East river near Blackwell's island, was for a long time considered as the young of the common round clam. Col. Totten first detected its specific identity. It occurs abundantly on all the sandy shores of Massachusetts, but its extreme northern and southern limits are not yet known.

VENUS PRÆOPARCA.

(STATE COLLECTION.)

Venus præparca. SAY, Journ. Acad. Nat. Sciences, Vol. 2, p. 271.
V. notata, var.? GOULD, Invertebrata of Mass. p. 87.

Description. Shell ovate, with numerous elevated subacute parallel concentric lines, which subside into mere wrinkles near the suture of the ligament-slope; interstitial spaces plain: ligament-slope flattened, margined by an acute line. Anterior margin with an obsolete longitudinal very obtuse undulation, which gives the tip of this margin a slightly truncated appearance; areola cordate, elevated at the suture: lower and posterior margins crenulated, the crenulæ extending along the edge of the areola to the beak. In advance of the anterior termination of the ligament-groove of the left valve, is another distinct groove, which receives the edge of the corresponding margin of the other valve.

Color, white, immaculate; within, white or yellowish white.

Vertical axis, 1·0 – 1·5; transverse ditto, 1·5 – 2·2.

This shell occurs frequently along our beaches, and is usually taken for the young of the *V. mercerania*. Dr. Gould states that it seems to be same as *V. notata*, in which merely the zigzag lines are wanting. It seems to me more widely transverse than either.

(*EXTRA-LIMITAL.*)

V. inequalis, SAY. Shell subcordate, longitudinally sulcated: lines numerous, obsolete on the anterior margin; behind the middle, bifid, and alternating with smaller single ones: concentric distant lamellar bands but little more elevated than the longitudinal lines. Anterior margin subangulated; within, the margin crenate; crenæ obsolete on the anterior margin and rear. Hinge on the posterior margin. Length, 1·0; width, 1·2. *Coast of New-Jersey and Maryland.*

V. elevata. (ID. Ib. p. 272.) Shell subcordate, longitudinally sulcate: sulci equal, numerous, dense; on the anterior submargin sparse: concentric elevated remote lamellar bands. Anterior margin subangulated at the tip; within, margin crenate; crenæ obsolete on the anterior margin, and near the hinge on the posterior margin. Length, 0·8; breadth, 0·9. *Southern coast.*

V. mortoni. (CONRAD, Ib. Vol. 7, p. 251.) Shell very large, cordate, inflated, thick and ponderous, with prominent recurved concentric laminæ, more elevated on the anterior and posterior margins; ligament-margin arcuate. Umbones prominent; lunule large, cordate, defined by a deep groove;

posterior extremity slightly emarginate: cavity of the cartilage profound. Teeth large, prominent, grooved. Muscular impressions very large; inner margin regularly crenulated. Length, 5·0 – 6·0. Allied to *præparca*, and larger than *mercenaria*. *Coast of North and South-Carolina.*

V. fluctuosa. (Gould, Inv. Mass. p. 87, fig. 50.) Shell moderately small, transversely ovate, lenticular, rather thin. Surface with 20 – 25 recurved concentric waves, vanishing at the side; areola none. Middle tooth in each valve cleft. *Color:* epidermis thin, glossy, yellowish; beneath this, white. Length, 0·8; height, 0·6; breadth, 0·22.

GENUS ASTARTE. *Sowerby.*

Animal unknown, but presumed to resemble that of *Venus*. *Shell* rounded, subequilateral, compressed, thick. Hinge with two strong diverging cardinal teeth on one valve, and two very unequal ones on the other, or only one large one; palleal impression simple; ligament exterior.

Astarte castanea.

PLATE XXVIII. FIG. 280.

(STATE COLLECTION.)

Venus castanea.	Say, Journ. Acad. Nat. Sc. V. 4, p. 273.
Astarte id.	Id. American Conchology, pl. 1. Totten, Am. Jour. Vol. 28, p. 348, fig. 2.
Crassina id.	Conrad, Mar. Conch. p. 72, pl. 17, fig. 3. Russel, Essex Jour. Vol. p. 57.
Astarte id.	Gould, Invertebrata of Mass. p. 76, fig. 45.

Description. Shell thick and heavy, suborbicular or subtrigonal, with prominent and nearly central beaks, much more elongated than in the following species. Surface with minute concentric wrinkles and larger waves, with faint traces of radiating lines. Area in front of the beaks very deeply excavated, short, broad and smooth: posterior slope almost straight, with a long narrow lanceolate depression. Hinge solid; the margin very broad, with one stout tooth with a pit on each side in one valve, and two somewhat diverging teeth in the other, with a cavity between them to receive the opposite tooth. Palleal impression without a sinus: basal margin crenulated within.

Color. Epidermis chesnut-brown, occasionally deep mahogany with darker and paler zones; posterior margin blackish: foot of the animal vermilion.

Vertical axis, 1·0 – 1·2; transverse ditto, 1·0 – 1·2. Diameter, 0·5.

Var. a. *picea.* With a few wrinkles without waves, large and solid; epidermis dark tar-colored (Gould).

Var. b. *procera.* Lighter colored; vertical axis longest (Totten).

This species occurs along the coast of Long island, on the outer bars generally, although it has been dredged within the harbors.

Astarte sulcata.

PLATE XXVIII. FIG. 231.

Venus sulcata. Montagu, Test. Brit. p. 131.
Crassina id. Turt. Conch. Ins. Brit. p. 131, pl. 11, fig. 1 and 2.
Astarte damnoniensis. Totten, Am. Journ. Sc. Vol. 28, p. 349, fig. 3, a. b.
A. sulcata. Fleming, Brit. An. p. 430. Gould, Invertebrata of Mass. p. 78, fig. 46.

Description. Shell solid, suborbicular, transverse, subinequilateral and perfectly closed. Surface undulated, with fifteen to eighteen or twenty distinct obtuse concentric equidistant ridges; the spaces between, wider than the ridges, widest at the middle, contracting, and with the ridges disappearing at the two ends. Beaks prominent, pointed and in contact. Anterior area deep, smooth and lanceolate; posterior slope slightly rounded, including a long narrow and deeply excavated corslet. Margins crenulated in adults; smooth in the young. Epidermis very adherent.

Color. Deep chesnut brown or greenish yellow; the ridges occasionally denuded, and exhibiting a white chalky appearance beneath.

Vertical axis, 1·2; transverse ditto, 1·0; diameter, 0·4.

The appearance of this shell, in its different stages of growth, has given rise to much confusion in its synonimes. It is occasionally found along the gravelly bottoms on the coast of Long island, but is more rare than the preceding.

(*EXTRA-LIMITAL.*)

A. lactea. (Brod. & Sow. Zool. Jour. Vol. 4, p. 365. Gould, l. c. p. 80, fig. 47.) Shell suborbicular, much compressed, concentrically wrinkled; an obsolete marginal tooth in each valve: ridges most conspicuous on the posterior slope. *Color:* epidermis yellowish brown. Vertical axis, 1·0; transverse ditto, 1·1. *Grand Banks.*

A.? quadrans. (Gould, Ib. p. 81, fig. 48.) Shell triangular, small, slightly oblique; anterior side longest. Surface smooth; beaks pointed, not inclined to either side; hinge with a small lateral tooth on the anterior margin of the left valve. *Color:* epidermis yellowish olive. Length, 0·45. Stomachs of fishes. *Coast of Massachusetts.*

FAMILY CYCLADÆ.

SHELLS *covered with an epidermis, and having on the hinge lateral teeth. Inhabiting pools, lakes and freshwater streams.*

OBS. This corresponds with the division *Conques fluviatiles* of Lamarck. The last named species forms a natural transition to this family. It comprises at present four genera, three of which are found in the United States.

GENUS CYCLAS. *Lamarck.*

Animal with its mantle with simple edges, and furnished with short and united tubes. Foot wide, compressed at its base, and terminated by a sort of appendix. *Shell*, small, thin, oval, inflated, transverse, equivalve. Beaks prominent. Hinge with two very minute cardinal teeth; each valve sometimes almost entirely wanting: lateral teeth compressed, transversely elongated, lamelliform. Ligament external.

CYCLAS SIMILIS.

PLATE XXV. FIG. 264, 265 (VAR.).

(STATE COLLECTION.)

Cyclas similis. SAY, Nich. Ency. Ed. Am. p. 4, pl. 1, fig. 9.
C. sarratogea et *sulcata.* LAM. An. sans vert. Ed. Brux. Vol. 2, p. 388.
C. similis. GOULD, Invertebrata of Mass. p. 72, fig. 53.

Description. Shell suboval, very convex in the adult, nearly equilateral. Outline varying with age; in the young shell, the anterior margin more broadly rounded; in the adult, both margins nearly but not quite equally rounded. Basal margin nearly straight. Beaks nearly central, slightly elevated and obtuse. Surface with nearly equidistant raised concentric lines, giving a sulcate or furrowed appearance to the valves, and generally a more conspicuous elevated darker wave marking a former stage of growth; these grooves are continued over the beaks, which are usually eroded. Hinge with minute very oblique teeth: the lateral ones very distinct, elongated, on one side terminating in an elevated triangular point; on the other, bifid, with an intermediate longitudinal slit in one valve, and an oval pit in the other.

Color. Epidermis varying from waxen to reddish brown; within bluish or bluish white.

Vertical axis, 0·2 – 0·5; transverse ditto, 0·25 – 0·6.

This is found occasionally of somewhat larger dimensions. It occurs in ponds and streams in various parts of the State. Under the name of *C. solida* (fig. 265), I had described and figured in my notes a shell, which more mature consideration induces me now to refer to the *C. similis*. It is very solid, subelliptical, convex, with concentric wrinkles; beaks nearly

central; a lamelliform plate in the place of cardinal teeth; lateral teeth scarcely rising above the margin of the shell; cavity chalky within, with faint radiating furrows. *Color*, dark olive brown. Vertical axis, 0·5; transverse ditto, 0·6. It was obtained from Sandy creek, Orleans county, and I had but a single specimen.

Cyclas dubia.

PLATE XXV. FIG. 261.

(STATE COLLECTION.)

Cyclas dubia. Say, Nich. Ency. Ed. Am. Vol. 4, pl. 1, fig. 10.
C. striatina. Lam. An. sans vert. Ed. Brux. Vol. 2, p. 388.
C. dubia. Gould, Invertebrata of Mass. p. 75, fig. 56.

Description. Shell small, moderately solid, subtriangular, oblique, subovate, convex; the beaks not very prominent, placed much nearer one end. Surface with minute concentric ridges, which become more distinct towards the basal margin. Primary teeth very distinct, placed between two pits in one valve, and two divaricating ones in the other; the exterior lamellar tooth very small, with the fossæ acutely elliptical.

Color. Epidermis olive-green tinged with reddish, with occasionally darker bands marking the stages of growth.

Vertical axis, 0·25 – 0·3; transverse ditto, 0·3 – 0·35.

I have obtained specimens of this shell from Herkimer county, and Dr. Newcomb has noticed them at Palmyra, Wayne county; they are doubtless to be found in ponds and ditches in every part of the State. The description of *C. striatina* by Lamarck, which he procured from Lake George, applies in every particular to this species.

Cyclas partumeia.

PLATE XXV. FIG. 262.

(STATE COLLECTION.)

Cyclas partumeia. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 380.
Cyclas cornea, var. 2, 3. Lamarck, An. sans vert. Ed. Brux. Vol. 2, p. 388.
C. partumeia. Adams, Am. Jour. Sciences, Vol. 40, p. 279.
C. id. Gould, Invertebrata of Mass. p. 73, fig. 54.

Description. Shell thin, fragile, pellucid, inflated, rounded oval. Beaks nearly central and moderately prominent. Posterior margin more broadly rounded than in front; basal margin regularly curved. Surface glossy, with minute regular concentric wrinkles and larger undulations which are impressed within; under the lens, faint radiating lines may be detected. Hinge teeth prominent and diverging; lateral teeth strong and prominent.

Color. Young, light waxen, passing into greenish horn in the adult, with bluish white or yellowish white on the margin. Animal, light pink.

Vertical axis, 0·3 – 0·45 ; transverse ditto, 0·45 – 0·6.

This species is common in swamps and sluggish streams in every part of the State. Its hitherto ascertained geographical range is from Masssachusetts to Ohio. I agree in opinion with Dr. Gould, that the varieties 2 and 3 of the *Cycla de cornée* accord perfectly with our species.

Cyclas rhomboidea.

PLATE XXV. FIG. 263.

(STATE COLLECTION.)

Cyclas rhomboidea. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 380.
C. id. Adams, Am. Jour. Sciences, Vol. 40, p. 277.

Description. Shell solid, transversely elongated, subequilateral, rhombiform ; the basal margin regularly curved, approaching a straight line. Beaks not greatly elevated, contiguous, often decorticated. Anterior margin subtruncated ; the posterior margin obtusely rounded. Two cardinal teeth in each valve, oblique with an intermediate pit ; the anterior smallest : the lateral teeth distinct, bipartite at each extremity. Surface polished, with minute concentric striæ : cavity with faint impressed incremental striæ.

Color. Epidermis olive-green to light chesnut ; within opake white.

Vertical axis, 0·45 ; transverse ditto, 0·7.

I refer to this species specimens procured from Rockland county by Dr. Budd, and from Lake Champlain. They are remarkable for their polished surface and rhomboidal outline. The dimensions given above are larger than those of Mr. Say.

Cyclas elegans.

Cyclas elegans. Adams, Am. Jour. Vol. 40, p. 277. Id. Bost. Jour. Vol. 3, p. 330, pl. 3, fig. 11.
C. id. Gould, Invertebrata of Mass. p. 74, fig. 55.

Description. Shell rhombic-orbicular, compressed in the young, much inflated in the adult ; the extremities subtruncated, so as to appear rhomboidal. Beaks nearly central, not prominent. Surface with fine concentric striæ ; the valves not regularly convex, but somewhat flattened down the middle, so as to produce a slight elevation from the beaks to the anterior and posterior portions of the basal margins. Cardinal teeth rudimentary, very thin ; lateral teeth strongly developed. Basal margin nearly straight.

Color. Epidermis olive-green, with a straw-colored marginal zone, and narrow zones at the different stages of growth ; within bluish white.

Vertical axis, 0·35 ; transverse ditto, 0·5.

This species occurs along the borders of Lake Champlain, where it was first noticed by Mr. Adams. It appears to be closely allied to what I consider to be the *C. rhomboidea* of Say, but differs chiefly in the cardinal teeth, which in this species are very slightly developed.

Cyclas edentula.

Cyclas edentula. Say, Desc. fluv. and terr. shells, p. 10.

Description. Shell transversely oval, inequilateral, with somewhat elevated and regular transverse lines. Beaks not elevated above the general surface. Cardinal tooth very small, lineolar, oblique, and not elevated higher than the edge of the hinge-margin: umbones decorticated. *Color*, brown.

Length, 0·35; breadth, 0·4.

This species, which I only know through the very brief notice of Mr. Say, was observed by him in the Canandaigua lake in this State. It is distinguishable, according to Say, by the diminutive teeth, which are not visible in a profile view of the hinge. The only species I could find in that lake was the *C. similis*, with the young of which this may possibly have been confounded.

(*EXTRA-LIMITAL.*)

C. transversa. (Say, Op. sup. cit.) Transversely oblong, subovate, subinequilateral: anterior margin decidedly more widely rounded than the posterior margin; beak obviously elevated above the general curvature; cardinal teeth double, distinct. Length, 0·25; breadth, 0·45. *Kentucky.*

C. staminea. (Conrad, Am. Jour. Vol. 25, p. 342.) Shell oval, regularly convex, inequilateral: anterior and posterior ends similarly rounded; umbo inflated; beaks slightly prominent; apex obtusely rounded; lateral teeth rather prominent; cavity rather capacious. *Color:* epidermis yellowish, with darker stains; within bluish white.

C. elevata. (Hald. Proceed. Ac. Sc. 1841.) Shell orbicular: cardinal tooth prominent; lamellar tooth thick; beaks elevated. *Color*, brownish olive. Length, 0·55; height, 0·5. *New-Orleans.*

Genus Pisidium, *Pfeiffer. Shell* equivalve, transverse; sides unequal, completely closing. In the right valve one, in left valve two, opposite very small primary teeth: behind and before, two thin lamellar side-teeth; those of the latter cleft in the right valve, in order to receive the opposite ones. *Animal* with a narrow fleshy projection next the forepart of the shell, instead of a tubular trachea: foot long and thin.

Obs. This genus was separated from *Cyclas* by Mr. Pfeiffer; but conchologists have not agreed as to the propriety of its creation. Deshayes observes, that the author "s'aperçut, en étudiant les animaux des cyclades, qu'il y en avait une dont les siphons postérieurs sont beaucoup plus courts que dans les autres espèces, et dépassent à peine les bords de la coquille. Il crut ce caractère suffisant pour justifier la création d'un genre sous le nom de *Pisidium.* Nous ne croyons pas qu'il soit utile d'adopter ce genre, ses caractères ayant trop peu de valeur."

P. abruptum. (Haldeman, Proc. Ac. Sc. 1841.) Shell ovate: beaks nearly terminal, whence the outline slopes rather abruptly towards the ventral margin. *Color*, olivaceous or chesnut. *Elk river, Maryland.*

P. abditum. (Id. Ib.) Shell small, ovate, rather elevated, ventricose: beaks in contact. *Color*, light ochraceous. *Springs, Lancaster County, Pennsylvania.*

Genus Cyrena, *Lam.* *Animal* with the lobes of the mantle united at their posterior third, and prolonged there by two siphons separated to their base. *Shell* solid, subtrigonal or suborbicular, turgid and ventricose. Hinge with three teeth in each valve. Lateral teeth two, one of which is near the primary ones. Ligament exterior, a great part of which is inserted.

C. caroliniensis, Bosc. (Say, Nich. Ency. Pl. 25, fig. 266 of this book.) Shell cordate, turgid: surface with numerous membranaceous wrinkles; umbo much eroded; beaks distant; two of the primary teeth canaliculate at tip; lateral anterior tooth most elevated; cavity profound. *Color:* epidermis olive brown; within salmon-colored; purplish on the margins. Length, 1·2; breadth, 1·3; diameter, 1·1. *Carolina.*

FAMILY SAXICAVIDÆ.

Shell *burrowing, without accessory valves, and more or less gaping at the anterior extremities: ligament external. Marine.*

Obs. This corresponds with the *Lithophages* of Lamarck; a family remarkable for their general propensity to imbed themselves in calcareous rocks, or in hardened clay beds, in such a manner that their anterior extremities always project outwardly. The manner in which this is effected is not yet ascertained. As it is exclusively in rocks of a chalky nature that they have been found, it has been concluded that an entrance must have been made by an acid secretion which would dissolve the rock. This reasoning would not apply to the cases where they are found, as in this country, in an indurated clay or peat bed. In this country, two genera have been observed.

GENUS SAXICAVA. *Fl. de Bellevue.*

Animal with the mantle closed all round, prolonged behind into a long tube which is double within, slightly divided at its summit, and pierced in front with a rounded aperture for the passage of a small slender lengthened and pointed foot. Mouth moderate; labial appendages small. Branchial plates free for the most part, and very unequal on the same side. *Shell* transverse, inequilateral; the anterior upper margin gaping. Hinge nearly without teeth; ligament external.

Saxicava distorta.

PLATE XXXIII. FIG. 309. A. B.

(STATE COLLECTION.)

Saxicava distorta. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 318.
S. id. Gould, Invertebrata of Mass. p. 61, fig. 40.

Description. Shell thick, coarse, transversely ovate-oblong, inequivalve, irregular in shape and often distorted, generally rounded in front and more or less truncated behind, often with a prominent rounded ridge passing from the beaks to the lower angle, and which is sometimes roughened with scales. Beaks rather prominent, and on the anterior third. Surface roughened and undulated by the different stages of growth. Basal margin irregular, usually contracted in the middle, with a silken appendage issuing from it. In young specimens, a slight rudimentary tooth in one valve is received into a cavity in the other, but both disappear with age.

Color. Epidermis light ashen grey: foot bright orange.

Vertical axis, 0·4 – 0·6; transverse ditto, 0·7 – 1·0.

This shell is found along the whole coast, adhering to marine bodies, and is so irregular that scarcely two specimens can be found alike. It is often found imbedded in *Sponges* and among *Ascideæ*. The *S. rugosa* of Turton (*Conch. Ins. Brit.* p. 20, pl. 2, fig. 10), with which this has sometimes been confounded, is more transversely elongated, the beaks more central, the elongated side more abruptly truncate, and the dorsal margin more sloping; the surface furrows are subquadrate following the truncation of the elongated side.

GENUS PETRICOLA. *Lamarck.*

Mantle with its borders simple, slightly dilated in front, where there is a small opening for the passage of a feeble tongue-shaped foot. Tubes small, conic, truncate at their summits, separated for two-thirds of their length, and minutely radiated at their orifice. Gills small. *Shell* transverse, inequilateral, rounded before, narrowed posteriorly: hinge almost toothless; ligament exterior.

Petricola pholadiformis.

PLATE XXVIII. FIG. 282.

(STATE COLLECTION.)

Petricola	*pholadiformis.*	Lam. An. sans vert. Vol. 5, p. 505. Ed. prior.
P.	*fornicata.*	Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 319.
P.	*pholadiformis.*	Id. Am. Conchology, pl. 60, fig. 1. Russel, Ess, Jour. Vol. 1, p. 55.
P.	*id.*	Conrad, Amer. Marine Conchology, p. 37, pl. 7.
P.	*id.*	Gould, Invertebrata of Mass. p. 63.

Description. Shell very much elongated transversely, with the beaks near the anterior end, inflated, cylindrical, equivalve. Anterior margin acutely rounded; the posterior margin obtusely rounded and slightly gaping. Hinge and basal margins nearly straight, almost parallel. Beaks elevated, with an ovate area in front, which is well defined. Surface coarsely marked with elevated lines, more or less conspicuous, radiating from the umbones, and most prominent on the anterior part of the shell; the surface is also coarsely marked by the lines of growth, which, on the radiating ribs, assume the form of tooth-like scales or spines. Teeth two in each valve, appearing to rise out of the cavity of the beaks, and curving upwards: in one valve, the anterior tooth distinct and grooved; the other in front, short. In the other valve is a large tooth, so deeply divided as to appear like two, and behind it a smaller, thin and divergent tooth. Interior surface impressed by the external radiating ridges.

Color, greyish brown; the dead shells chalky white.

Vertical axis, 0·6; transverse ditto, 1·7.

This species occurs along the coast of Long island, imbedded in ooze and the sedgy banks of creeks. The dead shells are frequently found along the coast. On account of the excessive delicacy of the teeth, it is rare to obtain perfect specimens.

Petricola dactylus.

PLATE 28. FIG. 283. A B.

Petricola	*dactylus.*	Sowerby, Genera, pl. 3.
P.	*id.*	Say, American Conchology, pl. 60, fig. 2.
P.	*id.*	Gould, Invertebrata of Mass. p. 65, fig. 41.

Description. Shell transversely oblong-oval, inflated. Basal margin curved; edges of the anterior margin everted: no distinct area before the beaks, which are prominent. Surface with numerous radiating raised ridges, which are not scaly as in the preceding; about 15 – 18 of these on the anterior portion are large and distinct, the remainder are filiform: the stages of growth marked by undulated lines. Two teeth in the right valve, and two in the other, of which one is bifid.

Color. Soiled brownish white.

Vertical axis, 0·7; transverse ditto, 1·5 – 2·0.

This species has been found at Glasshouse point above the city, and is a more robust shell than the preceding, from which it differs chiefly in the want of a definite area before the beaks. It appears to range from Massachusetts to Carolina, but is more rare than the preceding.

FAMILY MACTRIDÆ.

SHELL *equivalve, frequently gaping at the sides. Hinge with an internal ligament, and sometimes an external ligament beside.* ANIMAL *with a small foot, but well adapted for motion.*

GENUS MACTRA. *Lamarck.*

Animal with the edges of the mantle thickened and simple, furnished behind with two united moderately long tubes. Mouth small; labial appendages narrow and pointed. Branchial plates small, and nearly equal. Foot oval, trenchant, very long and angular. *Shell* transverse, slightly gaping at the sides: beaks prominent. Hinge a prostrate concave tooth to contain the cartilage, having at one margin a delicate erect tooth, like the letter v: two lateral teeth near the central ones.

MACTRA SOLIDISSIMA.

PLATE XXIX FIG. 286.

(STATE COLLECTION.)

Mactra solidissima. CHEMNITZ, Conch. Vol. 10, p. 365, pl. 170, fig. 1656.
M. id. CONRAD, Am. Mar. Conchology, 61, pl. 14, fig. 7. ID. Ac. Sc. Vol. 6, p. 257.
M. gigantea. LAMARCK, An. sans vert. Ed. Brux. Vol. 2, p. 535.
Spissula. GRAY, Loud. Mag. Nat. Hist. New series, Vol. I, p. 373.
M. solidissima. GOULD, Invertebrata of Massachusetts, p. 51.

Description. Shell large and solid, subtriangular, nearly equilateral, smooth or very slightly wrinkled by the lines of growth. Beaks large and protuberant, directed slightly forwards; nearly central, and behind them a broad somewhat flattened space bounded by a rounded elevation from the beaks. Hinge very strong; the spoon-shaped cavity large; the v tooth very delicate, and adhering by a very small base, so that it is usually broken off in the cartilage; lateral teeth long and thin, and regularly striated on the side next the recipient cavity.

Color. Epidermis thin and olive-brown or light yellowish; beneath this, chalky white.

Vertical axis, 1·5 – 4·5; transverse ditto, 2·0 – 6·0. Diameter, 1·0 – 2·5.

This is the largest of our bivalve shells, and is familiarly known on the shores of Long island as the *Beach Clam* and *Dipper Clam*. They are esteemed as an article of food. They occur buried in the sand, and the largest I have seen had a transverse length of nearly seven inches.

Mactra lateralis.

PLATE XXIX. FIG. 287.

(STATE COLLECTION.)

Mactra lateralis. Say, Journ. Acad. Nat. Sciences, Vol. 2, p. 309.
M. id. Conrad, Amer. Marine Conchology, p. 62, pl. 14, figs. 4, 5.
Mulinia. Gray, Loudon Mag. Nat. Hist. New series, Vol. 1, p. 376.
M. lateralis. Gould, Invertebrata of Mass. p. 54, figs. 34, 35.

Description. Shell small, triangular, very convex, polished, smooth or at least with very minute wrinkles, nearly equilateral. Beaks tumid, nearly central, contiguous, directed forwards: areas before and behind the beaks broad, flattened, sometimes concave, heart-shaped, and bounded by slightly elevated ridges. A stout prominent v tooth, and a strong lateral tooth on each side of it, in the left valve.

Color. Epidermis thin, rusty brown; beneath which, bluish white; within polished white.

Vertical axis, 0·3 – 0·7; transverse ditto, 0·7 – 0·9.

This is not a very common species, although it is occasionally found on the shores of Long island. It has been found at Glass-house point a few miles above the city, and also by dredging near Rye, Westchester county.

(*EXTRA-LIMITAL.*)

M. ovalis. (Gould, Op. cit. p. 53, fig. 32.) Shell large, thick, coarse, covered with a tough corrugated epidermis: beaks but little elevated; v tooth strong; lateral teeth short and slender, not striated. *Color:* epidermis dusky brown. Vertical axis, 2·5; transverse ditto, 3·5. Stomachs of fishes on the Northern Coast.

M. similis. (Say, Jour. Acad. Nat. Sc. Vol. 2, p. 309.) Shell almost as large as *solidissima*, triangular, smooth or very slightly wrinkled: beaks nearly central; lateral teeth strongly and regularly crenated on the side next the recipient cavity. Vertical axis, 1·15; transverse ditto, 1·4. *Rhode-Island, and probably this State.* Conrad supposes it to be the young and half grown of *solidissima.*

M. fragilis. (Chemnitz, pl. 24. *M. oblonga*, Say, Ib. Vol. 3, p. 310. Conrad, pl. 14.) Shell oblong-oval, transverse, very slightly wrinkled except upon the margins; umbo hardly prominent: two strong distant lines or folds drawn from the apex to the anterior extremity of the shell. *Color*, dull whitish, hardly polished; umbo slightly tinged with ferruginous; within white, high polished. Vertical axis, 0·45; transverse ditto, 1·9. *Coast of Georgia.*

M. nucleus. (Conrad, Ac. Sc. Vol. 6, p. 258, pl. 11; Am. Conch. pl. 14.) Small, triangular, thick, with an obsolete concentric ridge or angle: umbones flattened and rectilinear; apices nearly central and very acute; posterior slope depressed; lateral teeth strong. *Color*, pale brown. *New-Jersey*, and undoubtedly on our own coast, although not yet observed.

GENUS MESODESMA. *Deshayes.*

Animal with the mantle united on the posterior two-thirds of its length, and provided on its posterior extremity with two short tubes, prolonged within by a very delicate membrane. Foot much flattened, quadrangular, partly concealed by the gills; these latter short, truncated and connected together, the external pair smallest and subauriculated. *Shell* solid, subtrigonal, compressed and generally closed: hinge with a spoon-shaped cavity in each valve for the cartilage, and a simple and oblong tooth on each side.

Mesodesma arctata.

PLATE XXIX. FIG. 288. a. b.

(STATE COLLECTION.)

Mactra arctata. Conrad, Jour. Acad. Nat. Sciences, Vol. 6, p. 257, pl. 11, fig. 1.
M. deaurata. Id. Am. Mar. Conchology, p. 59, pl. 14, fig. 1.
Mesodesma arctata. Gould, Invertebrata of Mass. p. 57, fig. 39.

Description. Shell solid, subtriangular, very inequilateral; the anterior margin short, truncated. Beaks little elevated, quite in front, with a prominent ridge to the lower angle; posterior end produced, with the margin rounded. Surface with concentric ridges, caused by the different stages of growth: cartilage-pit very deep and triangular. Lateral teeth elongated, and crossed by regular elevated striæ. Interior smooth; the sinus of the palleal impression orbicular, and somewhat larger than its contiguous posterior muscular impression.

Color. Epidermis olive-yellow, with a metallic lustre; within whitish.

Vertical axis, 1·0; transverse ditto, 1·4. Diameter, 0·5.

This is not a very common species on our shores, but appears to be more abundant on the shores of Massachusetts.

(*EXTRA-LIMITAL.*)

M. jauresii. (Guerin, Mag. de Zool. 1834. Gould, loc. cit. fig. 38.) Shell ovate, triangular, thick, and very rough externally with coarse concentric ridges; beaks little elevated; lateral teeth very strong, curved and very faintly striated. *Color:* epidermis dusky brown. Vertical axis, 1·1; transverse ditto, 1·75. *Grand Banks.*

Genus LUTRARIA, *Lam.* Shell equivalve, inequilateral, transversely oblong or rounded, gaping at the ends. Hinge with one tooth, which is somewhat complicated; or two teeth, of which one is simple, with an adjoining deltoid hollow, which is oblique and prominent within: no lateral teeth; ligament internal, attached in a pit.

L. canaliculata. (SAY, Ac. Sc. Vol. 2, p. 311. CONRAD, Mar. Conch. pl. 10, fig. 1. PL. 31, fig. 298 of this work.) Transversely oval-orbicular, very thin and fragile, inflated: valves with equal concentric grooves; posterior margin short, subreniform, compressed; a marginal longitudinal irregular subimpressed line, between which and the edges the grooves become mere wrinkles; posterior slope nearly straight; gape considerable: anterior margin regularly curved; within grooved. *Color*, reddish white. Length, 2·1; breadth, 2·5. *Seacoast, Maryland to Florida.*

L. lineata. (SAY, Ac. Sc. Vol. 2, p. 310; Conch. pl. 9. *L. papyratia*, CONRAD, Conch. pl. 10, fig. 2.) Transversely suboval, thin: posterior gape patulous; anterior linear, and commencing beyond the hinge slope; valves unequally wrinkled, undulated within: anterior margin glabrous, and with an indented submarginal line corresponding with the exterior carinated one. *Color*, tinged with ferruginous. Length, 1·9; breadth, 2·7. *Georgia and Florida.*

Genus MONTACUTA, *Turton.* Shell ovate or oblong, equivalve, inequilateral, nearly closed: hinge with two teeth in each valve, and a cavity between them; lateral teeth none; ligament internal.

M. bidentata. (MONTAGU, Test. Brit. pl. 26, fig. 5. GOULD, l. c. p. 59.) Shell minute, ovate triangular: surface roughened by the lines of growth; beaks pointed, and near the broader end; tooth on the shorter side oblique and spoon-shaped, for the reception of the ligament. Within faintly marked by radiating lines. Vertical axis, 0·16; transverse ditto, 0·22. Occurs in sand. *New-Bedford harbor.* Rare.

Genus KELLEA, *Turton.* Shell somewhat globular, equivalve, closed: hinge with two approximate teeth and a remote lateral tooth in one valve, and a concave tooth and remote lateral tooth in the other; ligament internal.

K. rubra. (TURTON, Conch. Ins. Brit. pl. 11, fig. 7 and 8. GOULD, fig. 33.) Shell minute, suboval, very inequilateral: beaks prominent, with a smooth elongated and deep area before them; palleal impression distinct, without a sinus. *Color:* epidermis purplish or soiled brown. Vertical axis, 0·13; transverse ditto, 0·18. Among the roots of seaweed. *New-Bedford Harbor.*

GENUS CUMINGIA. *Broderip and Sowerby.*

Shell ovate, inequilateral, equivalve. A shallow spoon-shaped cardinal tooth, and a single small tooth by its side, in each valve; and a strong lateral tooth on both sides in one valve only. Palleal impression with a large sinus.

CUMINGIA TELLINOIDES.

Mactra tellinoides.	CONRAD, Jour. Ac. Nat. Sc. Vol. 6, p. 258, pl. 11, figs. 2, 3. ID. Mar. Conch. pl. 14, fig. 2.
M. id.	RUSSEL, Essex Journ. Nat. Hist. Vol. 1, p. 53.
Cumingia id.	CONRAD, Jour. Acad. Nat. Sciences, Vol. 7, p. 234.
C. id.	GOULD, Invertebrata of Mass. p. 56, fig. 36.

Description. Shell small, thin, fragile, ovate-triangular, nearly equilateral, inflated, broad in front, compressed behind, warped, ending in a rounded point. Beaks raised, with a small well defined area in front. Surface with concentric incremented lines, which are sharp and elevated, and crossed by microscopic radiations. In front of the cartilage pit in each valve is a linear tooth, forming part of its wall, and at its side a pit for the reception of the corresponding tooth: lateral teeth distinct in the right valve, but wanting in the left; the anterior one longest. Palleal impression far within the shell, with a broad deep sinus.

Color, bluish white; within bluish white.

Vertical axis, 0·45; transverse ditto, 0·6.

I am indebted to Dr. Gould for the description of this species, which I have not seen, but which is very probably to be found on the coast of this State.

(*EXTRA-LIMITAL.*)

Genus GNATHODON, *Gray.* Shell thick, nearly oval, equivalve, inequilateral, covered with an olivaceous epidermis; umbones distant. An acuminated cardinal tooth and two lateral teeth, the posterior elongated, the anterior uncinate in one valve; in the other, two acuminate and two lateral ones, the posterior of which is elongated, and the anterior wedge-shaped. Palleal impression with a small sinus: ligament internal, in a deep pit.

G. cuneatum, Sowerby. (GRAY, Loud. Mag. Vol. 1, p. 376, fig. 34. *Rangia,* DESM. Lin. Soc. Bord. Vol. 4, p. 58. CONRAD, Mar. Conch. p. 57, pl. 13. PL. 25, fig. 267 of this work) Shell very solid, inequilateral, subcordate, oblique: beaks prominent, incurved, often eroded; posterior margin subacute, anterior rounded; lunule heart-shaped, circumscribed by an obsolete raised line; left valve with two teeth on one side of the deep ligament pit, the anterior smallest, the outer with a broad lamellar tooth parallel with the posterior slope. *Color,* light olive brown. Vertical axis, 1·4; transverse, 1·7; diameter, 1·1. *Mobile.*

G. flexuosum. (CONRAD, Am. Jour. Sc. Vol. 38, p. 92.)

FAMILY ANATINIDÆ.

Shell *transverse, inequivalve, inequilateral, fragile, somewhat pearly, slightly gaping at one end. Hinge with a thickening or spoon-shaped process, to which the ligament is attached, usually supported within by an ossiculum.*

Obs. This family is formed from a part of the family *Myaires* of Lamarck, and is intended to correspond with the *Osteodesmacés* of Deshayes, as it has been revised and extended by Mr. Couthouy.

GENUS OSTEODESMA. *Deshayes.*

Shell oblong, transverse, trigonal, thin, fragile, pearly, inequivalve, slightly gaping at its ends. Hinge linear, having on each valve a narrow ledge to which the ligament is attached, and against which adheres, by its upper surface, a four-sided ossiculum. Muscular impressions small, the anterior elongated, the posterior rounded. Palleal impression with an excavation behind.

Osteodesma hyalina.

PLATE XXXIII. FIG. 311. a. b.

(STATE COLLECTION.)

Mya hyalina. Conrad, Journ. Acad. Nat. Sc. Vol. 6, p. 261, pl. 11, fig. 12.
Lyonsia id. Id. Amer. Mar. Conch. p. 51, pl. 11, fig. 2.
Amphidesma corbuloides. Mass. Cat. p. 25.
Osteodesma hyalina. Couthouy, Bost. Journ. Nat. Hist. Vol. 2, p. 166.
O. *id.* Gould, Invertebrata of Mass. p. 46, fig. 31.

Description. Shell thin, fragile, pellucid, transversely elongated; anterior side short and rounded; posterior side longest, produced, narrowed, compressed, slightly truncated and reflected at the end. Beaks prominent, inclined forwards, polished within. Surface with a thin membranaceous epidermis, which is concentrically wrinkled and corrugated by radiations most evident on the posterior portions. Umbones smooth and polished. Hinge with a delicate edge extending from the beak obliquely downward and backward, serving for the attachment of a ligament, which is also attached to the edge of the wedge-shaped ossiculum lying against that part. *Color*, pearly white.

Vertical axis, 0·35; transverse ditto, 0·6.

This exceedingly delicate little shell occurs along the sandy beaches of Long island. It has also been dredged from deep water at the Quarantine ground.

GENUS ANATINA. *Lamarck.*

Animal having the mantle closed by a wide membranous plate, with a small rounded aperture on the antero-inferior portion, for the passage of a tongue-shaped foot. Two elongated tubes separated for some considerable distance from their extremities; the inferior slightly longest. Branchiæ narrow, free, and pointed behind. *Shell* usually thin, sometimes translucent, fragile, ovate, rounded, nearly equivalve, inequilateral, gaping slightly at one or both extremities. Hinge with a prostrate spoon-shaped tooth in each valve, to receive the cartilage; and a small ossiculum resting in front of the teeth, usually removed with the animal.

ANATINA PAPYRACEA.

PLATE XXXI. FIG. 300.

(STATE COLLECTION.)

Anatina papyracea. SAY, Jour. Acad. Nat. Sc. Vol. 2, p. 314.
A. id. fragilis? TOTTEN, Amer. Jour. Sc. Vol. 28, p. 347, pl. 1.
A. papyracea. GOULD, Invertebrata of Mass. p. 47, fig. 28.

Description. Shell thin and fragile, ovate-rounded; one valve more convex, and at the basal margin projecting a little beyond the other. Beaks not prominent, in the posterior third of the length of the shell: from the beaks to the posterior portion runs an elevated angular ridge; shorter end narrowed and subtruncated, slightly gaping. Surface of the valves minutely wrinkled. Tooth long, narrow and oblique, with an accessory process at the base. Ossiculum like two crescents fitting in front of the teeth. *Color,* white and pearly.

Vertical axis, 0·5; transverse ditto, 0·6.

This delicate shell, which is rare, occurs along our whole coast. It has been obtained by dredging at Newport, Rhode-Island, and from the stomachs of fishes on the coast of Massachusetts.

GENUS COCHLODESMA. *Couthouy.*

Animal with a thin mantle, closed by a membrane in front, except at the antero-inferior extremity, where it gives passage to a broad compressed foot extending along the whole inferior surface of the abdominal mass. Edges of the pallium thickened, and a little rugose. Siphons long, narrow and divided in their whole extent, and opening separately into the branchial cavity. *Shell* thin, fragile, inequivalve, inequilateral; right valve most convex. Beaks moderately prominent, cloven; ligament double. Hinge a spoon-shaped process in each valve, supported by one or more oblique ribs. Palleal impression deeply indented behind.

COCHLODESMA LEANA.

PLATE XXXI. FIGS. 299, 301. A. B.

(STATE COLLECTION.)

Anatina leana. CONRAD, Jour. Acad. Nat. Sc. Vol. 6, p. 263, pl. 11, fig. 11.
A. id. RUSSEL, Essex Jour. Nat. Hist. Vol. 1, p. 52.
Cochlodesma leana. COUTHOUY, Bost. Jour. Nat. Hist. Vol. 2, p. 170.
C. id. GOULD, Invertebata of Mass. p. 49, figs. 27, 30.

Description. Shell very thin and fragile, ovate, subcompressed; the left valve almost flat, rounded at both ends; the right valve convex, and subtruncate at the shorter end, slightly gaping at both ends. Beaks small, slightly cleft at one side: from the beaks proceeds a ridge, more or less obvious to the posterior end. Surface wrinkled, with a yellowish shining epidermis extending sowewhat beyond the margins; the spoon-shaped process in the hinge nearly horizontal, and resting on an oblique rib directed backwards: no ossiculum.

Color, white beneath the epidermis.

Vertical axis, 0·9; transverse ditto, 1·3.

This is found occasionally along our coast, and is said to be very abundant about Cape Cod. The flattened valve is frequently eroded in the centre.

GENUS THRACIA. *Leach.*

Animal resembling *Anatina.* *Shell* usually thin, transversely oval, inequivalve; right valve most convex, slightly gaping at both ends. Beaks well marked, and inclined a little backwards. Tooth represented on each valve by a more or less prominent spoon-shaped process. Occasionally a cylindrical and semicircular ossiculum is attached to the posterior extremity of the internal ligament. Palleal impression deeply excavated behind.

OBS. This genus was first established by Leach, and has been subsequently more amply developed by Deshayes, and also by Mr. Couthouy in his elaborate monograph of the Family *Osteodesmacea* already cited above.

Thracia conradi.

PLATE XXVIII. FIG. 284.

Thracia declivis. Conrad, Am. Marine Conch. p. 44, pl. 9, fig. 2 (exc. syn.).
T. conradi. Couthouy, Bost. Jour. Nat. Hist. Vol. 2, p. 153, pl. 4, fig. 2.
T. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 75.
T. id. Gould, Invertebrata of Mass. p. 50.

Description. Shell thin, fragile, ventricose, rounded in front, narrowed and subtruncate behind. Beaks prominent, with one or more obtuse carinations extending to the angle of the basal and posterior margins; the beak of the right valve perforated to receive the points of the other. Right valve more convex, and extending somewhat beyond the left: valves slightly gaping. Hinge toothless, but represented by strong rounded eminences. Surface with a thin epidermis, and with concentric undulated striæ. Palleal impression with an acute angular sinus: no ossiculum.

Color. Epidermis light brown; within white.

Vertical axis, 2·2; transverse ditto, 2·7. Diameter, 1·4.

This is one of the largest species of the genus, and is found along the coasts of Rhode-Island, Massachusetts and Maine. Mr. I. Cozzens assures me that he has obtained it in Long island sound, along the shores of Connecticut, so that in all probability it exists on the shores of this State.

(*EXTRA-LIMITAL.*)

Genus Amphidesma, *Lamarck.* Shell inequilateral, transverse, suboval or somewhat rounded: sides slightly gaping. Hinge with one or two cardinal teeth, and a narrow groove for the internal ligament; external one short; internal one fixed in the internal grooves.

A. flexuosa. (Lam. Vol. 2, p. 344. Tellina *id.* Montagu, Test. p. 72.) Shell suborbicular, thin, convex, pellucid, fragile, with minute irregular concentric striæ. A remarkable furrow extends from the apex parallel to the cartilage-slope, and forms a deep curve in the margin at its termination. Hinge with an obsolete tooth. *Color*, white. Length, 0·6. On the authority of Mr. Redfield, this has been found on the coast of Massachusetts.

A. transversa. (Say, Conch. pl. 28.) Shell transversely short, oval, nearly equilateral, compressed, a little gaping. Hinge nearly central: margins subequally rounded behind and in front; the former somewhat more obtusely so. Basal margin regularly rounded without any undulation in front: apex obtuse, but little prominent. Cardinal teeth two; fosset dilated, fusiform, abruptly very narrow at the beaks: lateral teeth none. Posterior muscular impression very slender and elongated. *Color*, tinged with yellowish. Width, 1·5. *Long Island Sound? Southern Coast.*

A.? punctata. (Say, Ac. Sc. Vol. 2, p. 308.) Orbicular, with numerous minute concentric wrinkles and very numerous minute punctures. No lateral teeth; two primary teeth in each valve, of which one has a deep groove: within, a small rim or projecting line runs near the edge from the hinge to the basal margin. *Color*, white. Length, 0·3; width, 0·3. *Southern Coast.*

A. orbiculata. (Id. Ib. Vol. 2, p. 317.) Shell orbicular, somewhat compressed: beaks nearly central, and a little prominent; valves slightly wrinkled transversely. Hinge with two lamellar teeth;

the posterior placed near to the primary tooth, and shorter than the anterior one. *Color*, solid white. Length, 1·1; breadth, 1·1. Allied to the succeeding species. *Georgia.*

A. radiata. (Say, Ib. Vol. 5, p. 220.) Transversely oval-orbicular, a little compressed. Apex nearly central, a little prominent; posterior slope a little concave. Primary teeth two in each valve; lateral teeth very distinct. *Color*, with rosaceous radii, sometimes obsolete; within tinged with yellow, and the rosaceous radii very distinct. Length, 0·9; breadth, 1·1. *East-Florida.*

A. lepida. (Id. Ib. Vol. 5, p. 221.) Shell very much compressed, subtriangular, very thin, pellucid, equilateral, with concentric wrinkles and longitudinal striæ, which curve on the anterior margin towards the anterior edge, and behind towards the posterior slope. Cardinal teeth obsolete; lateral teeth prominent. *Color*, pellucid, iridescent. Length, 0·2; width, 0.2. *South-Carolina.*

A. æqualis. (Id. Ib. Vol. 2, p. 307; Am. Conch. pl. 28.) Shell orbicular, slightly oblique, polished, with numerous concentric wrinkles near the margin, obsolete on the disk and umbo. Primary teeth two in the left valve and one in the other, which has no lateral tooth. *Color*, white. Length, 0·4. Not uncommon on the Southern Coast.

FAMILY MYADÆ.

Shell *often inequivalve, inequilateral, gaping at both extremities or at one only. Hinge with an irregularly shaped tooth or teeth in one valve, received into an excavation in the other, with an intermediate ligament.*

Obs. This group is formed of part of the Family *Pyloridés* of Blainville, and embraces portions of the two families *Myaires* and *Corbulées* of Lamarck. It is represented on our coast under three generic forms.

GENUS PANDORA. *Bruguières.*

Animal with the mantle in the form of a sheath, and terminating behind in two tubes united only at their bases, rather short, open in front for the passage of a large triangular foot, which is thick and dilated at its end. Gills large, free behind; or the two pair are united, and terminate in a point in the tube. Labial appendices rather large, triangular, not striated. *Shell* thin, pearly within, transversely oblong, inequivalve, inequilateral: right valve flattened; left valve more convex. Hinge with two diverging teeth in the flat valve, and corresponding grooves in the other.

Pandora trilineata.

PLATE XXXIII. FIG. 310. A. B.

(STATE COLLECTION.)

Pandora trilineata.	Say, Jour. Acad. Nat. Sc. Vol. 2, p 261. Id. Conchology, pl. 2.	
P.	*id.*	Conrad, Am. Mar. Conch p. 49, pl. 11, fig. 1. Russel, Ess. Jour. Vol. 1, p. 54.
P.	*id.*	Gould, Invertebrata of Mass. p. 44.
P.	*nasuta.*	Sowerby, fig. 18 – 19.

Description. Shell irregularly wedge-shaped, rounded before, with a recurved subtruncated beak behind. Hinge-margin with a concave curve; the surface above flattened, and bounded on its edges by two elevated lines from the beaks to the rostrated tips; anterior portion of the basal margin strongly curved. Surface with fine undulated incremental striæ and faint radiating lines; rostrated portion coarsely wrinkled and gaping. Three or more distinct lines radiate from the beaks. The flat valve with two teeth, of which one is shorter and more robust than the other; the cavities in the other valve, to receive these teeth, exhibit between them the appearance of three teeth or teeth-like elevations.

Color. Pearly white; within, bluish iridescent.

Vertical axis, 0·45 – 0·6; transverse ditto, 0·9 – 1·2. Diameter, 0·2.

This delicate and singular species occurs on our coast from Maine to Florida. It is found along the shores of Long island and Staten island. On the coast of the latter island it is very commonly washed ashore, attached to seaweed. Here its locality is limited to a small spot at the foot of Coverly's lane, on the south side. In the more perfect and larger specimens, a fourth oblique line may be traced between the two approximated hinge-marginal lines and the third oblique one. In many specimens, a byssus associated with *sertulariæ* is attached to the beaks.

GENUS MYA. *Linnæus.*

Animal with a moderately thin mantle, adhering by its edges, closed by a membranous plate, and forming behind around its tubes a loose membranous envelope into which it is retracted. Tubes united, slightly separated at their summits, and radiated at the orifices. Foot very small, coming out from the mantle by a small slit at the antero-inferior portion in the median line. Gills moderate, unequal, on the same side. Mouth small, with triangular striated appendices. *Shell* moderately thin, transverse, gaping at both ends, with an epidermis. Left valve with a single broad compressed upright tooth, received into a pit of the opposite valve.

Mya arenaria.

PLATE XXX. FIG. 290.

(STATE COLLECTION.)

Mya arenaria. Linn. Syst. Nat. p. 1112. Lam. An. sans vert. Ed. Brux. Vol. 2, p. 527.
M. mercenaria. Say, Journal Acad. Nat. Sciences, Vol. 2, p. 313.
M. arenaria. Conrad, Amer. Mar. Conchology, p. 42, pl. 9. fig. 1.
M. id. Gould, Invertebrata of Mass. p. 40.

Description. Shell transversely ovate, subequilateral, convex (but slightly more so in one valve), gaping at both ends, but more so at the posterior ends, which are slightly curved outwardly. Surface roughened, and antiquated by the different stages of growth. Beaks small. Tooth in the left valve erect, spoon-shaped, with a grooved ridge on the back, projecting beyond the margin like another tooth; between this and its corresponding cavity in the other valve is a strong ligament. Palleal impression deeply notched behind.

Color, chalky white or ferruginous; epidermis dull brown.

Vertical axis, 1·5 – 2·0; transverse ditto, 3·0 – 5·0.

This is one of our most abundant and useful species on the coast of New-York. It is found every where, burrowed a few inches under the sand, between high and low-water mark; and is readily detected by a small aperture in the sand, through which it ejects a stream of water upon treading hard on the sand in its neighborhood. It is known under the various appellations of *Long Clam* and *Piss Clam*, to distinguish it from the common *Round Clam* (*V. mercenaria*). In some districts it still retains its ancient aboriginal appellation of *Maninose*. It forms a very nutritious article of food; and when properly cooked, is by many equally prized with the oyster. On many parts of Long island, the hogs are accustomed to root for this species, and follow the change of tides with unerring sagacity. There is a strongly marked and constant variety found in our waters, which has the anterior longer than the posterior margin; the upper extremity is compressed, gaping and very much contorted, and more gibbous than the typical form of the species. This variation has been attributed to its locality among coarse gravel.

(*EXTRA-LIMITAL.*)

M. acuta. (Say, l. cit. Vol. 2, p. 313.) Shell oblong-ovate, narrowed behind, rather strongly wrinkled: posterior hinge and basal margins subequally arcuated; tip of posterior margin equidistant from the apex and middle of the base. Tooth moderate, with a small not prominent tooth on its posterior side. Length, 1·5; width, 2·8. Considered by some writers as a variety of the preceding. *Southern Coast.*

M. truncata. (Lin. Syst. Nat. p. 1112. Gould, l. c. p. 42. Pl. 29, fig. 289 of this book.) Shell oblong-ovate, or subquadrate and truncated behind, where it gapes widely: basal margin irregularly sinuous; epidermis tough and corrugated; tooth broader than long, with a slightly thickened

lobe on the edge: valves ridged by the stages of growth, convex; beaks moderately prominent. *Color:* epidermis yellowish; beneath white. Length, 1·5 – 2·5; width, 2·5 – 3·5. Common on the Grand Banks: a few valves occasionally found on the shores of Massachusetts.

GENUS CORBULA. *Bruguières.*

Animal unknown. *Shell* moderately solid, subtrigonal, inequivalve, inequilateral, slightly gaping. Hinge with a small conic erect recurved tooth in each valve, one received into a pit by the side of the other: cartilage between the teeth. Palleal impression feebly excavated.

CORBULA CONTRACTA.

PLATE XXVIII. FIG. 285.

(STATE COLLECTION.)

Corbula contracta. SAY, Jour. Acad. Nat. Sciences, Vol. 2, p. 312.
C. id. GOULD, Invertebrata of Mass. p. 43, fig. 37.

Description. Shell small, solid, convex; valves subequal, shortest and rounded in front, long and pointed behind. Beaks rather prominent, nearly touching each other at their points: basal margin contracted and concave in the middle. Surface with regular equidistant concentric impressed lines and intervening ridges. A prominent ridge runs from the beaks on each side to the posterior basal margin, including a broad space between them: left valve shutting within the other along the basal margin. Epidermis thin. In one valve the tooth is simple, hooked and turned towards the beak; in the other, it is broader than high, projecting at right angles to the valve, with a deep cavity on the posterior side of the base for the reception of the hooked tooth.

Color. Epidermis dull brown; beneath dead white.

Vertical axis, 0·25; transverse ditto, 0·4. Diameter, 0·2.

This little shell is not uncommon along our coast, from Florida to Cape Cod. I have found it on the shores of Long island, and Mr. Linsley of Stratford has sent it to me from the shores of Connecticut. The epidermis is occasionally ferruginous.

FAMILY SOLENIDÆ.

SHELL *generally thin, elongated transversely, without accessory pieces, and gaping only at the lateral extremities; ligament exterior.*

GENUS SOLEN. *Linnæus.*

Animal with its mantle closed in its whole length, adhering by its edges, and attached to the lower edge of the shell by a double membrane which is reflected upon itself to form the epidermis; presenting below a tube, double within, conic, annulated, and capable of great elongation, with two simple orifices; that of the siphon larger than that of the vent. Foot quite in front, large, conic, swollen in the middle. Branchiæ long, narrow, pointed behind, adhering on two lines in front on each side of the body, then uniting at a certain distance behind into one line. Labial appendices elongated, triangular. Mouth small. Vent at the end of a very small tube floating in the cavity. *Shell* moderately thin, translucent, much elongated transversely, equivalve; sides nearly parallel. Beaks very small, terminal. Cardinal teeth small, rounded, variable.

SOLEN ENSIS.

PLATE XXXIII. FIG. 313.

Solen ensis. LIN. Syst. Nat. p. 1114.
S. id. CONRAD, Am. Mar. Conch. p. 27, pl. 5, fig. 1.
S. id. RUSSEL, Essex Journ. Nat. Hist. Vol. 1, p. 51. GOULD, Invertebrata of Mass. p. 29.

Description. Shell cylindrical, elongated transversely, slightly curved, the sides parallel; ends truncate, more or less convexly rounded. Surface with glossy epidermis, and a long triangular space marked by the concentric lines of growth; remaining part of the shell with lines parallel to the basal margin. Hinge at one end, with a single tooth, and a sharp lateral plate of one valve entering between two teeth and a double plate of the other; the terminations of the two plates, when not broken off, rise up in a curved manner, and cross each other like teeth.

Color, greenish olive; the long triangular space faded purple.

Vertical axis, 0·5 – 1·0; transverse ditto, 5·0 – 6·0.

This is the common *Razor-shell* of our shores, and occurs on both sides of the Atlantic. It lives in the sand near and below low-water mark, and is esteemed in many parts of the world as a good article of food.

(*EXTRA-LIMITAL.*)

S. viridis. (Say, Ac. Sc. Vol. 2, p. 316. Conrad, Mar. Conch. pl. 5, fig. 2. Plate 33, fig. 312 of this book.) Shell transversely oblong, compressed. Hinge-margin nearly straight: basal margin rounded; posterior end obliquely truncated, a little reflected and rounded near the base; anterior end rounded. Surface smooth, with very slight concentric lines, marking the various stages of growth: hinge terminal. A single tooth in each valve, having a flattened vertical surface which turns upon that of the opposite tooth. *Color:* epidermis pale green, becoming olivaceous with age. Vertical axis, 0·4; transverse, 2·0. *Southern coast.*

Genus Lepton, *Turton.* Shell flat, nearly orbicular, equivalve, inequilateral, a little open at the sides. Hinge of one valve with a single tooth, and a transverse linear lateral one, each side; the other valve with a cavity in the centre, and a transverse deeply cloven lateral tooth each side, the segments of which divaricate from the beak: ligament internal.

L. fabagella. (Conrad, Mar. Conch. p. 51, pl. 11, fig. 3. Plate 32, fig. 307, a. b. of this book.) Shell very small, suboval, convex, with minute crowded concentric lines; beaks central, rather prominent. Epidermis thin and wrinkled: teeth similar in each valve; the posterior tooth longest, and angulated under the beak. *Color:* epidermis yellowish. Vertical axis, 0·3; transverse, 0·4. *Rhode-Island.*

GENUS SOLECURTUS. *Blainville.*

Animal too large for its shell. Lobes of the mantle thick in front, united and elongated in its posterior half into two large unequal siphons, which are united very near the summit. Foot tongue-shaped, large, very thick. Labial appendices very long and narrow. Branchiæ narrow, very long, extending through the whole length of the branchial siphon. *Shell* transverse, elongated, equivalve; the beaks small, subcentral. Margins nearly parallel; ends abruptly rounded. Hinge with two or three cardinal teeth in each valve: ligament prominent, seated on thick callosities. Palleal impression with a very deep sinus.

Solecurtus caribæus.

PLATE XXXII. FIG. 302.

(STATE COLLECTION.)

Solen caribæus. Lam. An. sans vert. Vol. 2, p. 522. Ed. Brux.
Solecurtus caribæus. Conrad, Am. Marine Conchology, p. 22, pl. 4, fig. 2.
S. (*Cultellus.*) *id.* Gould, Invertebrata of Mass. p. 30.

Description. Shell thick and solid, transversely elongated, resembling in shape some species of *Unio*, rounded at both ends; the upper and basal margins nearly parallel, the latter compressed and slightly arcuated. Beaks obtuse and little elevated, and placed towards the

posterior end. Surface with a thick epidermis, and coarsely wrinkled concentrically. Hinge with two curved cardinal teeth, with a thickened callus behind, to which the ligament is attached; two teeth, or rather a bifid tooth, in the other.

Color. Epidermis straw-colored; darker at the extremities.

Vertical axis, 0·8 – 1·5; transverse ditto, 2·6 – 4·0.

This species occurs along the southern coast, and extends northwardly nearly to Cape Cod. It has been observed near Rye, Westchester county, by Dr. J. C. Jay.

(*EXTRA-LIMITAL.*)

S. fragilis, Montagu. (*S. centralis*, Say. Ac. Sc. Vol. 2, p. 316. *S. fragilis*, Conrad, Conch. pl. 4, fig. 1. Gould, p. 31.) Shell small and delicate, transversely oblong-ovate, compressed, arcuated, equilateral. Hinge with two large ascending teeth in each valve; in the left valve, one is broad and emarginate at the tip. *Color:* epidermis yellowish. A reddish purple band passes from the beaks across the shell. Vertical axis, 0·5; transverse ditto, 1·5 – 2·0. *Massachusetts, Southern coast.*

GENUS MACHÆRA. *Gould.*

Animal not much larger than the shell. Edges of the mantle pectinated from near the siphon to the hinge, except where they pass over the foot: similar appearances along their inner submargin near the siphon. Labial appendages long, extending quite across the foot, pointed. Branchiæ extending to the opening of the siphon, and embracing about half the breadth of the foot. Foot hatchet-shaped, dilating towards its extremity, which is obliquely truncated. Siphons united at their tips, which have scattered hairs. *Shell* transversely oblong-oval, compressed, inequilateral, moderately gaping: beaks minute. Hinge with three diverging cardinal teeth in the left valve; the middle one bifid; the third compressed, delicate, taking the direction of the margin, or obsolete: on the right valve, two entering between those of the opposite valve. Within, usually crossed by a strong longitudinal rib. Muscular impressions joined by a deeply sinuous palleal line: ligament prominent.

Machæra costata.

PLATE XXXII. FIG. 301. A. B.

(STATE COLLECTION.)

Solen costatus. Say, Jour. Acad. Nat. Sciences, Vol. 2. p. 315.
Solecurtus id. Id. Am. Conchology, pl. 18.
S. id. Conrad, Am. Mar. Conch. p. 21. pl. 4, fig. 2. Gould, Invertebrata of Mass. p. 31.

Description. Shell thin and fragile, oval-oblong, much compressed; ends unequally rounded; basal margin regularly and widely curved. Beaks very minute, and at the anterior fourth of

the shell. Teeth three in the left valve; the posterior upright; the others directed forwards. A strong broad rib passes from the beaks towards the margin, where it becomes obsolete. Surface smooth and diaphanous, with minute wrinkles about the posterior end, and faint traces of radiations. Epidermis smooth and shining.

Color. Pale violaceous, passing into olive towards the margins, disposed in a radiated manner; within, bluish white, faintly iridescent; the transverse rib white.

Vertical axis, 0·8; transverse ditto, 1·5 – 2·0.

This is a northern species, occurring as far south as New-Jersey. On the coast of Massachusetts it is very abundant, but is more rare on our coast.

(*EXTRA-LIMITAL.*)

M. nitida. (Gould, Am. Jour. Vol. 38, p. 196; Invertebrata of Mass. p. 33, fig. 25, 26.) Shell thick, slightly recurved, ovate-oblong, undulated by the lines of growth. In the left valve, three teeth; in the right, two. *Color:* epidermis greenish yellow, shining, corrugated at the posterior end. Vertical axis, 1·25; transverse, 2·8. *Massachusetts.*

GENUS SOLEMYA. *Lamarck.*

Animal with the lobes of its mantle reunited in their posterior half, and terminated by two short and unequal siphons. Foot proboscis-like, truncated in front by a sort of disk or sucker, the edges of which are fringed. A single branchia on one side in the shape of a plumule, the barbs of which are divided to the base. Vent terminal, not floating. *Shell* equivalve, transverse, inequilateral. Epidermis thick and shining, projecting far beyond the margin. Beaks inconspicuous. Hinge-margin widened and excavated to form a receptacle for a cartilage, usually resting on a rib-like support.

Solemya velum.

PLATE XXX. FIG. 292.

(STATE COLLECTION.)

Solemya velum. Say, Jour. Acad. Nat. Sciences, Vol. 2, p. 317.
S. id. Conrad, Am. Mar. Conchology, p. 66, pl. 16.
S. id. Russel, Ess. Nat. Hist. Vol. 1, p. 53. Gould, Invertebrata of Mass. p. 35.
S. id. Wheatley, Catalogue of the Shells of the U. S. p. 5.

Description. Shell very thin and fragile, transversely oblong-elliptical; beaks not elevated; umbones scarcely apparent; the basal and hinge-margins parallel, ends rounded. Hinge toothless, placed near the anterior end, with a slightly prominent cartilage resting on an arched bony support, which is itself supported beneath by pillars which are directed across

the shell. Surface covered with a stout glossy epidermis, which extends beyond the basal and lateral margins, and at the hinge margin connecting the valves together for nearly their whole length. On the margin where it projects, it is cleft at the ends of the radiating lines, so as to produce a series of rounded lobes.

Color. Epidermis reddish brown or chesnut-color, with light yellow radiations, which are nearly equidistant, with the exception of a free space directly opposite the hinge; within bluish white: against the light, the external radiations are visible.

Vertical axis, 0·35 – 0·5; transverse ditto, 0·8 – 1·0.

This shell occurs on the shores of Massachusetts, and, according to Mr. Wheatley, on the shores of Long island; and should it prove identical, as several conchologists have suspected, with the following from Rhode-Island, we may expect to find the latter variety in the waters of our own State.

(*EXTRA-LIMITAL.*)

S. borealis. (Totten, Am. Jour. Vol. 26, p. 366. Couthouy, Bost. Jour. Vol. 2, p. 155. Gould, l. c. p. 36. Pl. 30, fig. 291 of this work.) Shell fragile, oblong, but larger and more solid than the preceding. Radiations with a larger free space; the edges of the epidermis not rounded by the slits, but preserving a square form, and are everted; the cartilage support not arched or vaulted, but forked, with the hinder branch directed obliquely forwards. *Color*, dark blackish brown. Vertical axis, 0·8; transverse, 2·5. Mr. Couthouy noticed one with a transverse axis 4·5 long. *Rhode-Island, Massachusetts.*

Genus Panopea, *Men. de la Groye.* Shell equivalve, transverse, unequally gaping at the sides and at the base: a small conical tooth on each valve, and a rounded callosity at each side, to which the ligament is affixed.

P. arctica. (Lam. l. c. Vol. 2, p. 526. Gould, l. c. fig. 27.) Shell oblong, subcylindrical, strong, widely gaping at both ends, rounded in front, truncated behind, traversed by two radiating wave-like ridges which divide the surface into three nearly equal portions. Vertical axis, 1·5; transverse, 2·5; diameter, 1·3. When viewed from behind, it resembles somewhat the outline of *Pholas crispata. Grand Banks.*

Genus Glycimeris, *Lam.* Shell transverse, inequilateral, greatly gaping above and below: hinge-margin callous, without a tooth; ligament external; epidermis thick, extending beyond the margin of the shell.

G. siliqua. (Lam. l. c. Vol. 2, p. 526. Russel, Ess. Jour. Vol. 1, p. 51. Gould, l. c. p. 39. Pl. 33, fig. 308 of this work.) Shell transversely oblong, compressed, heavy and solid: epidermis thick and shining, and obliquely wrinkled; beaks not prominent, eroded; ligament large and prominent on the shorter end. Interior with a very thick callus in the course of the palleal impression; callus of the hinge broad and prominent. *Color:* epidermis shining black; within ashy white. Vertical axis, 1·0 – 1·5; transverse axis, 2·5 – 3·5. *Grand Banks.* A few dredged on the coast of Massachusetts. Common to both sides of the Northern Atlantic.

FAMILY PHOLIDÆ.

SHELL *without a tubular sheath. Hinge either with one or more accessory bony pieces, or gaping widely in front. Penetrate by boring into wood, stones, or indurated clay.*

GENUS PHOLAS. *Linnæus.*

Animal with its mantle reflected on the dorsal portion, connecting together the valves and accessory pieces; anterior opening moderately small. Foot short, oblong and flattened. Tubes often elongated and united into one, which is very extensible. Mouth small, with very small labial appendices. Gills long, narrow, and a little unequal on each side, united in the same line for almost their entire length, and prolonged into the siphon. *Shell* transverse, gaping at both sides; hinge-margin rolled outwards, and toothless: a rib-like curved tooth arises from the cavity of the beaks, and is directed across the shell.

PHOLAS CRISPATA.

PLATE XXXII. FIG. 306. A. B.

Pholas crispata. LIN. Syst. Nat. p. 1111. LAM. l. c. Vol. 2, p. 518, Ed. Brux.
P. id. RUSSEL, Essex Jour. Nat. Hist. Vol. 1, p. 50.
P. id. GOULD, Invertebrata of Mass. p. 27.

Description. Shell large, thick and strong, oval-oblong, rounded behind; subangular or beaked in front; both extremities widely gaping, the valves touching only at two points the hinge and middle of the basal margin. Surface divided into two portions by a broad furrow, running almost vertically from the beaks to the base; the anterior portion coarsely marked with lamellar concentric plates. Within smooth, but showing the outer broad vertical furrow.

Color, soiled greyish white, occasionally rust-colored.

Vertical axis, 1·5 – 2·0; transverse ditto, 2·5 – 3·0.

This species is common to Europe and America. On the coast of the United States, it appears to range from Massachusetts to Carolina. Large single valves are occasionally found on the shores of Long-island. It is more abundant on the seacoast south of New-York.

Pholas truncata.

PLATE XXXIV. FIG. 223. a. b.

(STATE COLLECTION.)

Pholas truncata. Say, Jour. Ac. Nat. Sciences. Vol. 2, p 321.
P. id. Wheatley, Catalogue of Shells United States, p. 4.

Description. Shell subpentangular; anterior obtusely rostrated, wedge-shaped in the middle; posterior margin broadly truncated at the tip. Valves transversely wrinkled, crossed by striæ, muricated (particularly on the anterior side) with small erect scales which are not arched beneath; posterior margin without striæ, and mutic. Hinge-callus without cells: a small tooth on the inner margin, projecting backwards; the dentiform process curved, prominent, flat, slender.

Vertical axis, 0·7; transverse ditto, 1·7.

This appears to be a common shell on the southern coast, but is rare with us. It has been found imbedded in peat bogs at Sachem's head (Connecticut), at Throg's neck (Westchester county), at Glasshouse point above the city, and at Staten island, (Richmond county).

(*EXTRA-LIMITAL.*)

P. costata, Lin. (Deshayes, Conch. pl. 3, fig. 10. Gould, l. c. p. 27.) Shell very large, thin, inflated, with strong crenulate radiating ribs about half an inch apart on the basal margin, becoming abruptly closer, armed with small vaulted scales formed by transverse striæ passing over them. *Color*, white. Vertical axis, 2·0; transverse, 7·0. Common on the shores of the Southern States. An extensive bed of dead shells has been found at New-Bedford, Mass.

P. cuneiformis. (Say, Ac. Sc. Vol. 2, p. 322.) Wedge-shaped; anterior margin nearly closed, transversely truncated from the hinge; posterior margin with a rounded lip; a deep furrow from the beak to the middle of the basal margin, impressed within. Surface with transverse undulating striæ, with elevated minutely crenate lines. Hinge-callus forming a cavity before, and without cells; dentiform process filiform, incurved; hinge-plate ovate-triangular, with a short projecting angle on the anterior middle, and subacute behind. *Color*, white. Vertical axis, 0·45; transverse, 0·8. Occurring frequently in old wood. *Southern Coast.*

P. oblongata. (Say, Ib. Vol. 2, p. 320.) Shell thin, transversely much elongated: basal and hinge margins nearly parallel; ends rounded. Valves transversely and longitudinally striated; the striæ muricate, and elevated into costæ on the anterior side, which are more prominently and densely muricated. Hinge-callus minutely striated transversely and longitudinally, and with about twelve cells, anterior to which is a recurved margin of the shell, forming a cavity; dentiform process dilated, incurved, spoon-shaped, emarginate behind, and irregularly truncate at the tip. Vertical axis, 1·2; transverse, 4·4. *Carolina, Georgia, and East-Florida.*

FAMILY TEREDINIDÆ.

Shell *either inclosed in a calcareous tube distinct from its valves, or encrusted either partially or wholly in it, or projecting beyond it. Marine.*

Obs. This group corresponds with *Les Tubicolées* of Lamarck, and the *Teredinites* of Latreille. It comprises at present six genera; the living representative of one only has yet been observed on the coast of the United States.

GENUS TEREDO. *Linnæus.*

Animal much elongated, vermiform, with the mantle very slender, opened in front and at its lower portion for the passage of the foot. Tubes separate, very short. Mouth small; labial appendices short. Vent at the end of a small tube floating in the cavity of the mantle. Gills ribbon-shaped, united in their whole length in a single line slightly extended into the siphon. A muscular ring at the point of junction of the mantle and tubes, in which is implanted a pair of corneo-calcareous pediculated appendices, acting laterally against each other. *Shell* bivalve, orbicular, hemispherical, equivalve, terminating behind in a long cylindrical tube. Hinge with a long curved tooth in each valve, inserted under the margin: no lateral teeth nor ligament. Tube cylindrical, straight or flexuous, closed with age at the buccal extremity.

Teredo navalis.

PLATE XXXIV. FIG. 325. A. B. C.

(STATE COLLECTION.)

Teredo navalis. Linn. Syst. Nat. p. 1267. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 49.
T. id. Gould, Invertebrata of Mass. p. 26.

Description. Shell with valves, ear-shaped behind, triangular, forming a circular ring touching each other only at two points (the surface elegantly striated in various directions), each with a triangular projection in front, bending a little inwards; one of them with a curved denticle on the margin above the teeth: the edges of the ear-shaped processes behind are not detached around the whole of the circumference. Tube more or less flexuous, semiconcamerated behind (See fig. a.). Length of valves, 0·5 – 0·7; of tube, 5·0 – 6·0.

This is the well known *Ship-worm*, which scarcely extends north of the waters of this State. The supplemental valves within the tube, and near the small extremity, are spoon-shaped, convex on the outside and concave within, terminating in a linear elongation (See fig. c.). I am indebted to Turton for the figures. Its greatest ravages in our waters, take place in August and September. The long galleries which it excavates are lined with a second kind of tubular shell.

ORDER V. CIRRHOPODA.

Animal *enveloped with a mantle in the form of a sac, which is open only behind, enlarged at the inferior portion, terminated above by a certain number of pairs of cirri, which are long, corneous, articulated, ciliated and curving at the summit. Head not distinct, without eyes or tentacles; mouth with lateral corneous dentated and articulated jaws. Gills in pairs on each side at the base of the first cirri; anus central at the base of this tube.* Shell *very variable in form, and composed (except in one genus) of many valves, adherent either directly or indirectly by means af a fleshy tube. Marine.*

FAMILY BALANIDÆ.

Animal *resembling those of the* Lepadæ, *but without peduncle, and with its branchiæ in the form of two fringed wings attached to the internal surface of the mantle. Marine.* Shell *solid, conical or cylindrical, formed of one or more pieces united laterally, open at the base, or closed by a membranous or calcareous partition by which it adheres; always open above, but furnished there with a pyramidal opercle consisting of two or four valves.*

Obs. About ten generic groups have been described.

GENUS CORONULA. *Lamarck.*

Animal with the characteristics of the family. *Shell* depressed, formed of six triangular pieces, conoid, truncated at its extremity; walls very thick, with radiating cells. Opercle of four small triangular valves, joined to the opening of the tube by a membrane.

Coronula diadema.

Lepas diadema, Lin. *C. id.* Gould, Invertebrata of Mass. p. 12.

Description. Shell globose-conical, truncated at the tip. Surface with twelve triangular compartments: six with the tips downwards, plain and transversely striated; six with the tips upwards, and with four rounded ribs marked across with beaded folds. Orifice mostly closed by a membrane, through a fissure in which, closed by two valves, the arms are protruded.

Height, 1·0. Diameter, 1·5 – 2·0.

Occurs imbedded in the skin of whales. Several years since, I observed them attached to a whale caught off Sandyhook and exhibited in this city. Among them I noticed what I conceived to be *C. balænaris.*

(*EXTRA-LIMITAL.*)

C. denticulata. (Say, Ac. Sc. Vol. 2, p. 325. *Astrolepas*, Gray.) Shell depressed-conic; base oval: height equal to about one-third of the base. Valves and interstices smooth; the anterior valve largest, posterior smallest. Opercle transversely striate. Posterior pair of valves with a submarginal impressed line, from which to the edge are drawn three or four other impressed lines. Attached to *Limulus polyphemus.*

GENUS BALANUS. *Bruguières.*

Shell conical, occasionally elongated, composed of six valves. Opercle pyramidal, slightly oblique, of four triangular valves, of which the two smallest are spoon-shaped.

Balanus miser.

PLATE XXXIV. FIG. 318.

(STATE COLLECTION.)

Balanus miser. Lam. An. sans vert. Vol. 2, p. 491.
B. id. Russel, Essex Jour. Nat. Hist. Vol. 1, p. 48.

Description. Shell gregarious, much broader than high, conic-truncate, oblique on one side, more vertical and slightly beaked on the other side. In the young shells, they are slightly festooned at the base; in the full grown specimens, as exhibited in the plate, the sides towards the base are coarsely rugose: opercular valves transversely striated; the inferior valves most projecting.

Color, soiled greenish or whitish.

Height, 0·05 – 0·25. Diameter of base, 0·15 – 0·5.

The young are brownish or whitish. It is the most common species on our shores, attached to stones and logs between high and low water. If not identical with the common *ovularis* of Gould, it is a very closely allied species.

Balanus interruptus.

(STATE COLLECTION.)

Description. Shell conic-truncate, somewhat broader than high, more oblique on one side, gregarious. Aperture oval; the superior valves semi-concentrically striate. Side with very prominent rounded ribs, often bifid at the base; each rib divided into 4 – 6 segments, which are subimbricate: about midway, in many specimens, the segments are short and crowded.

Color, ashen gray.

Height, 0·3. Largest diameter of base, 0·5.

This species is found adhering to rocks in Long-island sound. It appears to be allied to *B. geniculatus* of Conrad, but its ribs are destitute of the two angular elevations.

Balanus eburneus.

PLATE XXXIV. FIG. 320.

(STATE COLLECTION.)

B. *eburneus.* Gould, Invertebrata of Mass. p. 15, fig. 6.

Description. Shell isolated, conical, robust, smooth and polished, with angular elevations and minute horizontal and vertical rugæ, oblique on one side and more vertical on the other. Aperture jagged, beaked on one side. Base oval or rounded, either partially or entirely closed, concentrically striate; the inner side of the base vertically striate, the pieces united by horizontally pectinated edges. The two upper opercular valves largest, triangular, concentrically striated and reticulated; the lower emarginate.

Color. Ashen white; lip often with a pinkish hue; valves greenish.

Height, 0·4 – 0·7. Diameter of base, 0·6 – 0·9.

This species is not uncommon on floating timber on the northern shores of Long island. I have received specimens from the northern coast, under the name of *B. ovularis*, from which, however, it appears widely to differ. It is the largest species I have met with on the coast of New-York. It is never gregarious. In my notes I had named it *B. democraticus*, but it appears to be identical with the species described by Dr. Gould under the name cited above.

Balanus fistulosus.

PLATE XXXIV. FIG. 319.

(STATE COLLECTION.)

Balanus fistulosus. Brug. Encyclop. Method, p. 166, pl. 164, figs. 7, 8.
B. id. Lam. An. sans vert. Vol. 2, p. 496. Ed. Brux.
B. elongatus. Gould, Invertebrata of Mass. p. 13, fig. 8.

Description. Shells gregarious, crowded, elongated, tubular, with irregular rings often strangulated, larger at the summit than at the base, vertically striated for more than half the length, vertically rugose towards the summit. Valves with concentric elevated costæ towards their bases, dehiscent above. Aperture ample.

Color. Soiled greenish above; white or pinkish white on the tubular body.

Height, 0·5 – 1·0. Diameter of aperture, 0·2; of base, 0·15.

This is a common species on our coast, attached generally to docks, wharves, and other submerged timber exposed to the flow and recess of the tides. They are so strongly gregarious, that it is not uncommon to see a single specimen with clusters of others attached to the circumference of its aperture. They are often much shorter and broader than the dimensions given above. Some conchologists are inclined to believe it to be a variety of *B. miser* or *ovularis*, but with this opinion I cannot coincide. Its constant and regular occurrence in places where it had ample room for development, forbids the supposition of its being an accidental variety.

(*EXTRA-LIMITAL.*)

B. tintinnabulum, Lin. (Gould, l. c. p. 13.) Shell conical; the six triangles with irregular unequal longitudinal ribs marked across by distant incremental striæ, and the smooth intervening spaces by deeply sculptured lines. Two anterior opercular valves deeply grooved or plaited; the two others rising above them like a beak. *Color*, purplish. Height, 1·5; diameter of base, 1·0. Accidental visiter.

B. geniculatus. (Conrad, Ac. Sc. Vol. 6, p. 265, pl. 11, fig. 16. Gould, l. c. fig. 9.) Prominent, flexuous, longitudinal. Ribs alternately larger and smaller, with two angular elevations on each, between which the valves are crossed by a carinate line. Opercular valves coarsely striated; aperture large. *Color*, greenish white. Height. 0·6; diameter of base, 1·0. Attached to *P. magellanicus*. *Maine, Massachusetts.*

B. rugosus, Montagu. (Gould, l. c. p. 16.) Subcylindrical. Valves raised into angular points, coarsely and irregularly ribbed: aperture large, rhomboidal; opercle nearly smooth, with acute curved slightly diverging points. *Color*, white. Diameter of base, 0·75. *Massachusetts.*

B. elongatus. (CONOPEA *id.* SAY, Ac. Sc. Vol. 2, p. 324.) Elongated into compressed processes, acutely edged above and beneath, and usually as long as the body of the shell. Posterior opercular valves larger, more prominent, truncated or widely emarginate at the tip. *Color,* soiled brown epidermis; under this, white, clouded and lineated with brown. On *Gorgonia virgulata. Southern coast.*

B. punctatus. (MONTAGU, Test. p. 8, pl. 1, fig. 5. PENN. Br. Zool. Vol. 4, p. 147, pl. 40, fig. 3.) Shell conical-truncate, rugged, with the valves and opercle punctured; edges of the superior and inferior of the opercular valves indented and locked into each other. *Color,* dull brown. Height, 0·25. *Northern coast?*

B. ovularis, Lam. (GOULD, l. c. fig. 7.) Shell small, variable in shape, more or less furrowed externally; aperture rhomboidal. Opercular valves obsoletely striated; the anterior ones shortest and acute; the posterior ones deeply notched near the obtuse summit. *Color,* white. Common. *Northern coast.*

FAMILY LEPADÆ.

ANIMAL *with its mantle extended beneath into a contractile and fleshy pedicel, by which it is attached to submarine bodies.* SHELL *composed of five principal valves.*

GENUS ANATIFA. *Lamarck.*

Animal compressed, with a very thin mantle, and supported by a tendinous and tubular peduncle. Cirri curved, and issuing from the side towards the summit of the body. *Shell* subtriangular, compressed, formed of five very distinct valves enveloping completely the animal.

ANATIFA ANSERIFERA.

PLATE XXXIV. FIG. 315.

(STATE COLLECTION.)

Lepas anserifera. LIN. Syst. Natı p. 1109.
Lepas striata? GOULD, Invertebrata of Mass. p. 20.

Description. Shell compressed, subtriangular. Valves five, polished; the angular incremental lines are distinct, and crossed by slightly grooved lines. The azygous valve long, curved, carinate and deeply furrowed longitudinally, and curved under the base; its attenuated upper extremity concealed between the two smaller valves. Peduncle corrugated.

Color. Shell pearly white; margins brownish; peduncle reddish.

Height, 0·6; width at base, 0·4; length of peduncle. 0·5.

Found on ship's bottoms in the harbor of New-York.

Anatifa vitrea.

PLATE XXXIV. FIG. 316.

Anatifa vitrea. Lam. An. sans vert. Vol. 2, p. 500.
A. id. Wheatley, Catalogue of Shells of the United States, p. 4.

Description. Shell exceedingly thin and fragile, translucent, papyraceous, short triangular; the dorsal valve forming a distinct angle behind, dilated and enlarged towards the base. Surface of the valves with faint incremental lines. Peduncle short.

Height, 0·8. Width of base, 0·5.

This was one of the largest of several hundred specimens attached to each other, and to a mass of seaweed floating near the Quarantine ground in the harbor of New-York, in the month of July. It was observed by Mr. Charles Wheatley. The smallest did not exceed 0·3 in height.

Anatifa dentata.

PLATE XXXIV. FIG. 317.

(STATE COLLECTION.)

Anatifa dentata. Brug. No. 3. Lam. An. sans vert. Vol. 2, p. 500.
A. id. Dillwyn, Cat. 32. Gould, Invertebrata of Mass. p. 21, fig. 11.

Description. Shell with the valves more robust than the preceding; the lateral valves with an elevated ridge from the base to the summit, over which are angulated parallel striæ. Apex obliquely truncated. Dorsal valve sharp, compressed, with ten to twelve distinct serrated dentations.

Color, opake white.

Height, 1·1. Width of base, 0·4.

This species I have obtained from the bottoms of vessels in the harbor of New-York.

Anatifa lævis.

Anatifa lævis. Brug. Ency. Math. p. 166, fig. 1.
Lepas anatifera. Lin. Syst. Nat. p. 1109.
Anatifa lævis. Gould, Invertebrata of Mass. p. 19; woodcut, p. 11.

Description. Shell with the lower valves triangular, rather obtuse at the summit, slightly wrinkled by the lines of growth, crossed by very faint radiating lines: upper valves triangular, narrow, pointing downward; tip blunted, and leaving quite a large space occupied only by a membrane. Very near the apex is a distinct angle at the back: apex rounded; back valve rather broad, not much compressed, sometimes grooved lengthwise.

Color. Shell bluish white; cartilages and stalk at the base of the shell orange.

Length of shell, 1·0; of stalk, 1·0 – 6·0.

Found on the bottoms of vessels and driftwood. I have adopted Dr. Gould's description of this species.

GENUS CINERAS. *Leach.*

Animal with the mantle almost entirely naked, thick and subcartilaginous. Peduncle long and thick. With the general form of the preceding. *Shell* rudimentary, composed of five oblong small, very distant valves, two of which are on the side of the gap, and the other dorsal.

Cineras vittata.

(STATE COLLECTION.)

Lepas vittata, Solander. *Cineras id.* Lam. An. sans vert. Vol 5, p. 407, Ed. prior.
Cineras id. Jay, Catalogue Shells, p. 7. Gould, Invertebrata of Mass, p. 22.

Description. Body a membranous sac, scarcely distinct from the peduncle, terminating in two points, deeply channelled between. Mouth surrounded by twelve long slender curved subtriangular cirri, deeply cleft, with long ciliæ on the internal edges and short stiff setæ externally. Valves exceedingly minute.

Color. Whitish, membranaceous, with numerous longitudinal stripes of a dark chocolate-brown with irregular margins, appearing through the cuticular coverings: abdominal cirri whitish; on the sides punctate, and margined with dusky.

Total length, 1·3; of body, 0·7.

Occurring on ship's bottoms in the harbor of New-York. Found also on the larger sluggish fishes.

GENUS OTION. *Leach.*

Animal with two corneous ear-shaped tubes directed backwards, truncated, open at their points, and placed in the edge of the mantle, having a lateral opening, with many ciliated and articulated arms. *Shell* consisting of two small testaceous semilunar valves only, near the lateral opening.

OTION BLAINVILLII.

(STATE COLLECTION.)

Otion blainvillii. LAM. An. sans. vert. Vol. 2, p. 503. Ed. Brux.
Aurifère. BLAINVILLE, Dict. des Sc. Nat. Vol. 3, p. 135, supplement.

Description. Body swollen and pointed; aperture subelliptical. The two ear-shaped tubes are irregularly cylindrical, nearly as long as the body, with openings at their extremities. Cirri disposed round a common centre. I did not notice the lower aperture in the right tube, observed by Blainville. Peduncle twice the length of the body, and attached by a wide coriaceous disk.

Color. The markings similar to those of *C. vittata;* the body is, however, more of a dark purple: peduncle and body with dark fulvous stripes; ears white and spotted; cirri dark brown.

Total length, 2·0; of body, 0·8; of ears, 0·5.

Associated with the preceding on ships' bottoms in the harbor of New-York, and, like all the family, may be considered as introduced species.

(*EXTRA-LIMITAL.*)

O. cuvieri, Leach. (GOULD, l. c. p. 23.) Body a smooth leathery membrane, with a small crescent-shaped valve on each side of the aperture. *Color,* leaden brown, unspotted. Length, 2·0 – 4·0. Vessels' bottoms. *Massachusetts.*

ORDER VI. TUNICATA.

Marine animals, of a gelatinous substance, varying in form, furnished with membranous tunics (often of a leathery consistence) instead of a calcareous covering; with two apertures. Sometimes isolated; often many are united together into a common mass. No distinct head. Mouth, vent and gills within; the latter of various forms, but never divided into four leaflets.

Obs. The animals of this order, according to Cuvier, form a group under the name of *Acephala nuda*, arranged immediately after the testaceous Acephala. By Lamarck they are treated as a distinct class, and arranged between the Radiata and Worms. We follow Cuvier in considering them as belonging to the class Mollusca, but place them at the end of that class. They are not numerous in species, or perhaps it would be more proper to say that they have not as yet been very extensively examined. They are sessile or free. Some of them live isolated, without any organic connexion with each other; others are united in a common mass, but only in the adult state.

GENUS ASCIDEA. *Linnæus. Lamarck.*

Animal ovoid, more or less elongated, sometimes cylindrical, very variable in shape, with its covering more or less dense; enlarged or pedunculated at its base, and terminated above by two short unequal tubes, with the orifices radiated by tentacular papillæ.

Obs. This genus is rich in species, and, contrary to the usual law governing the habitat of other mollusca, appears to be more abundant and the species larger in northern latitudes. They are usually found grouped together, and sometimes growing upon each other. They appear to have no means of defence, unless by ejecting water from their two orifices. They furnish nutriment to marine animals, and man feeds on some species. The two orifices correspond to the two tubes of several bivalves, one serving to admit water, and the other to give passage to the fæces. One of the most common in our waters is a species closely allied to the *A. rustica* of Linneus. Many of those of the American coast have been described by Mr. Lesueur in the third volume of the Journal of the Academy of Natural Sciences.

Ascidea manhattensis.

Description. Oblong-oval, globular; orifices distant, elevated and surrounded by ten to thirteen verrucose processes; externally corrugated, often covered with marine sordes, concealing the natural color. When held against the light, the intestinal canal may be indistinctly traced. The shape varies according as they are crowded together or isolated; in the latter case, they are oval-orbicular.

Color. Uniform ashen-grey or brown.

Diameter, 0·3 – 1·0.

In the young, the orifices are both terminal. The aperturæ incarnatæ attributed by Linneus to the *rustica*, are wanting in this species, and the references to Müller indicate a very different animal. The *ovalis* of Lesueur, another allied species, has the tubes plaited. Our species is commonly found in the months of September and October, adhering to stones, dock-logs, and other submerged bodies. I refer to it a small *Ascidea*, about 0·3 in diameter, adhering to salt grasses.

(*EXTRA-LIMITAL.*)

A. rustica. (Lam. Vol. 1, p. 584. Gould, Invert. Mass. p. 319.) Rough; varying in size from a pea to that of a musket ball. *Color*, ferruginous; the orifices flesh-colored. *Northern Coast.*

A. plicata. (Lesueur, Acad. Nat. Sc. Vol. 3, p. 5, pl. 3, fig. *b.*) Body ovate, sessile: surface subglabrous, but with many large inflated folds on the side of the inferior aperture, crossed by smaller folds, and giving the appearance of small imbricated dilatations. Apertures approximate, unequal, terminal. *Color*, white. Length, 2·0. Ships' bottoms. *Philadelphia.*

A. ovalis. (Id. Ib. p. 6, pl. 3, fig. *a.*) Sessile; somewhat smaller than the preceding, and without the inflated folds. Apertures large, distant, placed at the extremity of two short plaited tubes: skin round the aperture thin, and apparently divided into many small obsolete angles. *Color*, white. Same locality with the preceding.

A. lobifera. (Id. Ib. p. 7.) Body sessile, wrinkled, subglobular. Apertures approximate, unequal, concealed among many irregular fleshy lobes. *Color*, dull black. Length, 1·5. *Florida.*

A. proboscidea. (Id. Ib. p. 6, pl. 1, fig. 4, 5.) Smooth; with an elongated proboscis containing the two tubes. Apertures placed on the summit of the proboscis, and contiguous. *Color*, white. An *Ascidea? Coast of Georgia.*

The *A. intestinalis* and *microcosmus* have also been stated to occur on the Northern Coast.

GENUS BOLTENIA. *Savigny.*

Envelope coriaceous: body dilated, and attached by a long footstalk. Branchial and intestinal orifices each quadrifid: branchial sac plaited longitudinally, surmounted by a circle of compound tentacular threads; the meshes of the respiratory tissue without papillæ. Abdomen lateral; liver none.

BOLTENIA RENIFORMIS.

PLATE XXXIV. FIG. 324.

(STATE COLLECTION.)

Ascidia clavata? MÜLLER, Prod. Zool. Danica, 2740.
A. globifera. SABINE, App. Parry's Voyage, No. 10.
Boltenia reniformis. MACLEAY, Lin. Tr. Lond. Vol. 14, p. 536, pl. 18.

Description. Sac oblong-oval, 2·5 in length and about 1·5 in diameter, tapering gradually into a cylindrical tube; it is of a leathery texture, corrugated longitudinally, and covered (as well as the tube) with *Tubularia*, *Flustra*, and other polypes. The tube is about the size of a large goosequill, five or six inches in length, and transversely corrugated. The specimen was too much injured to enable me to observe the branchial and intestinal orifices.

Color, of the tube, yellowish; of the sac, reddish externally; the membrane lining the interior, of a shining salmon-color.

This species was obtained by Mr. George Gibbes, by dredging in the harbor of New-York, and presented to the State Collection. It was firmly attached to a valve of the *Modiola papuana*.

LIST

OF

PLATES OF THE MOLLUSCA.

PLATE 1.

Fig.

1 Loligo punctata.
2 Clio borealis.
3 Ovaries of loligo.
4 Limax agrestis.
5 — flavus.

PLATE 2.

6 Helix exoleta.
7 — tridentata.
8 — thyroidus.
9 — alternata.
10 — arborea.
11 — appressa.
12 — albolabris.
13 — clausa.
14 — subglobosa.
15 — concava.
16 — palliata, var.
17 — dentifera.
18 — diodonta.

PLATE 3.

19 Helix monodon.
20 — elevata.
21 — monodon, var.
22 — fuliginosa.
23 — fallax.
24 — suppressa.

Fig.

25 Helix cellaria.
26 — indentata.
27 — hirsuta.
28 — auriculata.
29 — intertexta.
30 — rufa.
31 — labyrinthica.
32 — ligera.
33 — minuta.
34 — multilineata.
35 — pennsylvanica.
36 — palliata.
37 — perspectiva.
38 — profunda.
39 — subglobosa, var.
40 — striatella.
41 — solitaria.
42 Vitrina pellucida.
43 Bulimus lubricus.

PLATE 4.

44 Pupa milium.
45 — badia.
46 — exigua.
47 — contracta.
48 — pentodon.
49 — corticaria.
50 — ovata.

Fig.

51 Succinea ovalis.
52 — id.
53 — obliqua.
54 — campestris.
55 — avara.
56 Achatina vexillum.
57 Planorbis obliquus.
58 — parvus.
59 — trivolvis.
60 — megastoma.
61 — id.
62 — exacutus.
63 — bicarinatus.
64 — armigerus.
65 Limnea expansa, var.
66 — caperata, var.
67 — pallida.
68 — fragilis.
69 — caperata.
70 — megasoma.
71 — humilis.
72 — reflexa.
73 — fragilis.
74 — linsleyi.
75 — columella.
76 — umbrosa.
77 — emarginata.

PLATE 5.

Fig.
78 Limnea desidiosa.
79 — caperata, young.
80 — catascopium.
80* Planorbis lentus.
81 Limnea jugularis.
82 Physa heterostropha.
83 — planorbula.
84 — cylindrica.
85 — plicata.
86 — obesa.
87 — gyrina.
88 — glabra.
89 — aurea.
90 — ancillaria.
91 Auricula denticulata.
92 — bidentata.
93 — denticulata,var.
94 Tritonia reynoldsi.
95 Eolidia gymnota.
96 — bostoniensis.
97 — diversa.
98 Ancylus rivularis.
99 — calcarius.
99* Planorbis campanulatus.
100 Bulla insculpta.
101 — gouldi.
102 — obstricta.
103 Littorina rudis.

PLATE 6.

104 Margarita ornata.
105 Littorina palliata.
106 — tenebrosa.
107 Margarita arctica.
108 — multilineata.
109 Littorina neritoides.
110 — neritoides.
111 — neritoides.
112 — irrorata.
113 Margarita cinerea.
114 Helix spinosa.
115 Cingula aculeus.
116 Cavolina salmonacea.
Fig.
117 Cingula minuta.
118 — lævis.
119 Lacuna vincta.
120 Pleurotoma plicata
121 — bicarinata.
122 Turritella erosa.
123 — interrupta.
124 Scalaria subulata.
125 — lineata.
126 — novangliæ.
127 Valvata sincera.
128 — id. var.
129 — unicarinata.
130 — tricarinata.
131 Paludina disscisa.

PLATE 7.

132 Paludina integra.
133 — isogona.
134 — disscisa, young.
135 Melania depygis.
136 Anculotus carinatus.
137 — trivittatus.
138 Melania subularis.
139 Anculotus costatus.
140 Melania bizonalis.
141 — virginica.
142 — gemma.
143 Tornatella puncto-striata.
144 Natica triseriata.
145 — pusilla.
146 — immaculata.
147 — duplicata.
148 — heros.
149 Egg-case of Natica.
150 Natica clausa.
151 Crepidula convexa.
152 — fornicata, young.
153 — plana.
154 — fornicata, adult.
155 Calyptrea striata.
156 Sigaretus perspectivus.
157 Oliva literata.
158 Terebra dislocata.
Fig.
159 Marginella carnea.
160 Cancellaria couthouyi.
161 Buccinum undatum.
162 — wheatleyi.
162* — limatum.

PLATE 8.

163 Buccinum obsoletum.
164 — id. var.
165 — trivittatum.
166 — trilineatum.
167 Cerithium sayi.
168 — emersonii.
169 Pyramis striatula.
170 Odostomia trifida.
171 — seminuda.
172 Cerithium terebrale.
173 Purpura imbricata.
174 — bizonalis.
175 — lapillus.
176 Ranella caudata.
177 Rostellaria occidentalis.
178 Trichotropis borealis.
179 Columbella avara.
180 Pyrula spicata.
181 — id. young.
182 Fusus scalariformis.
183 — ventricosus.
184 — cinereus.
185 — islandicus.
185* Planorbis corpulentus.

PLATE 9.

186 Fusus decemcostatus.
187 — harpularius.
188 — imbricatus.
189 — rufus.
190 Pyrula canaliculata.
191 — pyruloides.
192 — carica.
193 — id. young.
194 Patelloida alveus.
195 Cemoria noachina.
196 Patelloida testudinalis.

Fig.

PLATE 10.

197 Dentalium dentalis.
198 Chiton emersonii.
199 — fulminatus.
200 — albus.
201 — apiculatus.
202 — id.
203 Ostrea borealis, var.
204 — id.

PLATE 11.

205 Pecten concentricus.
206 — islandicus.
207 — magellanicus.
208 Lima glacialis.

PLATE 12.

209 Anomia ephippium.
210 — aculeata.
211 Arca pexata.
212 — transversa.
213 Nucula minuta.
214 — sapotilla, var.
215 — proxima.
216 — radiata.
217 — thraciæformis.

PLATE 13.

218 Nucula limatula.
219 — myalis.
220 — sapotilla.
221 — gouldi.
222 Mytilus borealis.
223 — notatus.

PLATE 14.

224 Alasmodon arcuata.
225 — marginata.
226 — rugosa.

PLATE 15.

227 Alasmodon undulata.
228 Anodon unadilla.

PLATE 16.

229 Anodon subcylindracea.
230 — ferussaciana.
231 — edentula.

Fig.

PLATE 17.

232 Anodon plana.
233 — excurvata.

PLATE 18.

234 Anodon fluviatilis.
235 — benedictensis.
236 Unio radiatus.

PLATE 19.

237 Unio ochraceus.
238 — id.

PLATE 20.

239 Unio nasutus.
240 — novi-eboraci.
241 — luteolus.
242 — tappanianus.

PLATE 21.

243 Unio cariosus.
244 — id. var.
245 — compressus.

PLATE 22.

246 Unio complanatus.
247 Cardita borealis.
248 Crenella decussata.
249 Cardium pinnatulum.

PLATE 23.

250 Cardium grœnlandicum.
251 — mortoni.
252 — islandicum.
253 Velutina zonata.
254 — lævigata.

PLATE 24.

255 Donax fossor.
256 Mytilus pellucidus.
257 Modiola modiolus.
258 — plicatula.
259 Alasmodon corrugata.

PLATE 25.

260 Capsa lævigata.
261 Cyclas dubia.
262 — partumeia.
263 — rhomboidea.

Fig.

264 Cyclas similis.
265 — id.
266 Cyrena carolinensis.
267 Gnathodon cuneatum.

PLATE 26.

268 Cyprina islandica, young.
269 — id. adult.
270 Sanguinolaria sordida.
271 Tellina tenera.
272 — versicolor.
273 Lucina divaricata.
274 — radula.

PLATE 27.

275 Lucina contracta.
276 Venus mercenaria.
277 — gemma.
278 — notata.
279 Cytherea convexa.

PLATE 28.

280 Astarte castanea.
281 — sulcata.
282 Petricola pholadiformis.
283 — dactylus.
284 Thracia conradi.
285 Corbula contracta.

PLATE 29.

286 Mactra solidissima.
287 — lateralis.
288 Mesodesma arctata.
289 Mya truncata.

PLATE 30.

290 Mya arenaria.
291 Solemya borealis.
292 — velum.

PLATE 31.

293 Odostomia fusca.
294 — exigua.
295 — id.
296 — producta.
297 — insculpta.
298 Lutraria canaliculata.

Fig.

299 Cochlodesma leana.
300 Anatina papyracea.
301 Cochlodesma leana, var.

PLATE 32.

301 Machæra costata.
302 Solecurtus caribæus.
303 Skenea serpuloides.
304 Sanguinolaria fusca.
305 — sordida.
306 Pholas crispata.
307 Lepton fabagella.

PLATE 33.

308 Glycimeris siliqua.
309 Saxicava distorta.
310 Pandora trilineata.
311 Osteodesma hyalina.
312 Solen viridis.
313 — ensis.

PLATE 34.

315 Anatifa anserifera.
316 — vitrea.
317 — dentata.
318 Balanus miser.
319 — fistulosus.

Fig.

320 Balanus eburneus.
321 Terebratula caput serpentis.
322 — psittacea.
323 Pholas truncata.
324 Boltenia reniformis.
325 Teredo navalis.

PLATE 35.

326 Bulla triticea.
327 — oryza.
328 — canaliculata.
329 — debilis.
330 Buccinum ciliatum.
331 Pupa fallax.
332 Spirula peronii.
333 Amnicola porata.
334 Bulla lineolata.
335 — hiemalis.
336 Buccinum donovani.
337 Pupa pentodon.
338 Helix chersina.

PLATE 36.

339 Fusus bamfius.
340 — turriculus.
341 Buccinum vibex.

Fig.

342 Odostomia fusca.
343 Buccinum rosaceum.
344 Pleurotoma decussata.
345 Fusus tornatus.
346 Physa elongata.
347 Pupa simplex.
348 Limnea expansa.
349 Vermetus lumbricalis.
350 Janthina fragilis.

PLATE 37.

351 Loligo brevipinna.
352 — bartramii.
(*a*) Beak. (*b*) Magnified surface.

PLATE 38.

353 Loligo pavo.
354 — pealii.

PLATE 39.

355 Unio rosaceus, aged.
356 — id. female.

PLATE 40.

357 Unio rosaceus, male.
358 Anodon pavonia.

INDEX.

PAGE.

ACEPHALA, ... 166
ACERIDÆ, ... 14
Achatina flammigera, ... 56
— solida, ... 56
— striata, ... 56
— vexillum, ... 56
— virginea, ... 56
Alasmodon arcuata,..... 197
— corrugata, ... 198
— marginata, .. 196
— undulata,.... 198
— rugosa, ... 196
Amphidesma æqualis,... 238
— flexuosa,... 237
— lepida, ... 238
— orbiculata, . 237
— punctata, .. 237
— radiata,.... 238
— transversa, . 237
Amnicola cincinnatensis,. 88
— grana,..... 88
— limosa, ... 88
— lustrica,..... 87
— nickliana, ... 88
— porata, ... 88
Ampullaria depressus,... 124
— hopetonensis, 124

PAGE.

Ampullaria paludosa, ... 124
Anatina papyracea,..... 235
ANATINIDÆ, ... 234
Anatifa anserifera,..... 254
— dentata, ... 255
— lævis, ... 255
— vitrea, ... 255
Anculotus angulatus,.... 102
— carinatus, ... 101
— costatus, ... 102
— dentatus,..... 102
— melanoides, .. 102
— monodontoides, 102
— nigrescens,... 102
— pictus, ... 103
— proerosus,.... 103
— plicatus, ... 103
— pumilus,..... 103
— subglobosus,.. 103
— tæniatus,..... 103
— trivittatus,.... 102
Ancylus calcarius,..... 13
— diaphanus, ... 13
— filosus, ... 13
— fuscus,..... 13
— nuttallii, ... 13
— parallelus,..... 13

PAGE.

Ancylus rivularis, ... 12
— tardus,..... 12
Anodon benedictensis,... 204
— edentula, ... 201
— excurvata, ... 202
— ferussaciana,... 200
— fluviatilis,..... 203
— implicata, ... 202
— pavonia,..... 203
— plana,..... 201
— subcylindracea, . 200
— unadilla,..... 199
Anomia aculeata 168
— ephippium,..... 168
ARCADÆ,..... 176
Arca incongrua,..... 177
— pexata, ... 176
— ponderosa, ... 177
— transversa, ... 177
Arion hortensis,..... 23
Ascidea manhattensis, ... 259
— lobifera,..... 259
— ovalis,..... 259
— plicata, ... 259
— proboscidea, ... 259
— rustica, ... 259
Astarte castanea, ... 220

	Page.
Astarte lactea,	221
— quadrans,	221
— sulcata,	221
Auriculidæ,	57
Auricula bidentata,	57
— denticulata,	58
— obliqua,	58
Aviculidæ,	175
Avicula atlantica,	11
Balanidæ,	250
Balanus eburneus,	252
— elongatus,	254
— fistulosus,	253
— geniculatus,	253
— interruptus,	252
— miser,	251
— ovularis,	254
— punctatus,	254
— rugosus,	253
— tintinnabulum,	253
Boltenia reniformis,	260
Buccinum acutum,	134
— album,	134
— ciliatum,	134
— donovani,	134
— lunatum,	134
— obsoletum,	133
— ornatum,	134
— rosaceum,	134
— trivittatum,	132
— undatum,	130
— unicinctum,	134
— vibex,	133
— wheatleyi,	132
Bulimus lubricus,	55
— multilineatus,	56
— mutilatus,	56
Bulla canaliculata,	19
— debilis,	17
— gouldi,	15
— hiemalis,	18
— insculpta,	14
Bulla lineolata,	16
— obstricta,	15
— oryza,	18
— solitaria,	19
— triticea,	17
Calyptridæ,	155
Calyptrea striata,	155
Cancellaria couthouyi,	138
Capsa lævigata,	212
— deflorata,	212
Cardidæ,	204
Cardita borealis,	204
— incrassata,	205
— tridentata,	205
Cardium fasciatum,	207
— grœnlandicum,	206
— islandicum,	206
— mortoni,	207
— muricatum,	207
— pinnatulum,	205
— ventricosum,	207
Cavolina salmonacea,	11
Cemoria alternata,	156
— noachina,	156
CEPHALOPODA,	2
Cerithidæ,	128
Cerithium emersonii,	129
— ferruginium,	129
— greeni,	130
— muscarum,	130
— nigrocinctum,	129
— sayi,	128
— septumstriatum,	129
— terebrale,	136
Chamidæ,	208
Chama arcinella,	208
Chitonidæ,	163
Chiton albus,	163
— apiculatus,	164
— fulminatus,	164
— emersonii,	164
— marginatus,	164
Chiton ruber,	164
Cineras vittata,	256
Cingula aculeus,	110
— lævis,	111
— minuta,	110
CIRRHOPODA,	250
Clionidæ,	6
Clio borealis,	6
Cochlodesma leana,	236
Columbella avara,	139
Conidæ,	151
Conus leucostrictus,	151
— mus,	151
Corbula contracta,	241
Coronula diadema,	250
— denticulata,	251
Crenella decussata,	186
Crepidula convexa,	158
— depressa,	159
— fornicata,	157
— glauca,	159
— intorta,	159
— plana,	158
Cryptostomidæ,	153
Cumingiat ellinoides,	233
Cycladæ,	222
Cyclas dubia,	223
— edentula,	225
— elevata,	225
— elegans,	224
— partumeia,	223
— rhomboidea,	224
— similis,	222
— staminea,	225
— transversa,	225
Cyclostomidæ,	82
Cyclostoma cincinnatense,	82
— dentata,	82
Cyprina islandica,	215
Cyrena carolinensis,	——
Cytherea convexa,	216
— concentrica,	216

	Page.
Cytherea gigantea,	216
— occulta,	216
Dentalidæ,	160
Dentalium dentalis,	160
— attenuatum,	161
Donax fossor,	212
— variabilis,	212
— elevata,	212
Doridæ,	7
Doris illuminata,	8
Eolidia bostoniensis,	9
— diversa,	10
— gymnota,	10
Filurus dubius,	11
Fusus bamfius,	148
— bicolor,	148
— cinereus,	145
— decemcostatus,	145
— harpularius,	146
— islandicus,	144
— imbricatus,	149
— muricatus,	149
— pyruloides,	147
— rufus,	146
— ventricosus,	144
— scalariformis,	143
— turriculus,	149
— tornatus,	148
GASTEROPODA,	7
Glycimeris siliqua,	246
Gnathodon cuneatum,	233
— flexuosum,	233
Glandina truncata,	56
Glaucidæ,	9
Helicidæ,	25
Helix albolabris,	26
— alternata,	29
— appressa,	27
— arborea,	30
— aspersa,	47
— avara,	46
— auriculata,	49
Helix californiensis,	46
— cellaria,	37
— chersina,	44
— clausa,	31
— concava,	33
— columbiana,	46
— corpuloides,	45
— cumberlandiana,	47
— dealbata,	46
— dentifera,	34
— diodonta,	34
— egena,	45
— electrina,	30
— elevata,	36
— exoleta,	27
— fallax,	28
— fuliginosa,	37
— gularis,	46
— hirsuta,	36
— inflecta,	45
— interna,	46
— inornata,	39
— intertexta,	38
— indentata,	31
— irrorata,	45
— jejuna,	46
— labyrinthica,	39
— lasmadon,	47
— ligera,	40
— lineata,	44
— major,	45
— monodon,	35
— minuta,	40
— mitchelliana,	45
— multilineata,	41
— nuttalliana,	46
— oregonensis,	46
— palliata,	33
— porcina,	45
— profunda,	42
— perspectiva,	42
— pennsylvanica,	41
Helix rufa,	44
— sayi,	47
— septemvolva,	47
— solitaria,	43
— spinosa,	47
— striatella,	43
— subglobosa,	32
— suppressa,	38
— tridentata,	28
— thyroides,	29
— townsendiana,	46
— vancouvrensis,	45
— wardiana,	46
Helicinidæ,	82
Helicina fastigiata,	82
— occulta,	82
— orbiculata,	82
— plicata,	82
Janthina fragilis,	125
Io fusiformis,	103
Kellia rubra,	232
Lacuna vincta,	111
— neritoidea,	112
Lepadæ,	254
Lepton fabagella,	243
Limacidæ,	20
Limax agrestis,	20
— campestris,	22
— dorsalis,	22
— flavus,	21
— gracilis,	22
Lima glacialis,	175
— squamosa,	175
Limniadæ,	59
Limnea appressa,	74
— apicina,	75
— attenuata,	75
— bulimoides,	75
— caperata,	69
— catascopium,	67
— columella,	72
— desidiosa,	73

	Page.
Limnea emarginata, ...	73
— expansa, ...	75
— fragilis, ...	68
— ferruginea, ...	75
— gracilis, ...	70
— humilis, ...	71
— jugularis, ...	74
— linsleyi, ...	72
— megasoma, ...	70
— obrussa, ...	75
— pallida, ...	69
— reflexa, ...	71
— rugosa, ...	75
— solida, ...	75
— umbrosa, ...	68
— virens, ...	75
Littorina irrorata, ...	106
— neritoides, ...	108
— palliata, ...	106
— rudis, ...	104
— tenebrosa, ...	105
Loligo bartramii, ...	4
— bartlingii, ...	4
— brevipinna, ...	4
— illecebrosa, ...	4
— pavo, ...	4
— pealii, ...	4
— punctata, ...	3
Lucina contracta, ...	214
— divaricata, ...	214
— flexuosa, ...	214
— radula, ...	214
Lutraria caniculata, ...	232
— lineata, ...	232
Machæra costata, ...	244
— nitida, ...	245
Mactra fragilis, ...	230
— lateralis, ...	230
— nucleus, ...	231
— ovalis, ...	230
— similis, ...	230
— solidissima, ...	229
Mactridæ, ...	229
Margarita arctica, ...	108
— argentata, ...	109
— cinerea, ...	108
— multilineata, ..	109
— obscura, ...	109
— ornata, ...	107
— undulata, ...	107
Marginella carnea, ...	152
Melania acutocarinata, ..	99
— altilis, ...	95
— alveare, ...	94
— annulifera, ...	94
— arata, ...	98
— armigera, ...	93
— babylonica, ...	98
— blanda, ...	97
— bizonalis, ...	91
— bitæniata, ...	94
— boykiniana, ...	100
— canaliculata, ...	94
— caliginosa, ...	100
— catenoides, ...	100
— catenaria, ...	93
— cancellata, ...	93
— castanea, ...	92
— cincinnatensis, ..	95
— circincta, ...	99
— clavæformis, ...	93
— comma, ...	95
— columella, ...	96
— congesta, ...	96
— conica, ...	95
— concinna, ...	98
— costulata, ...	98
— crebricostata, ...	97
— curreyana, ...	97
— depygis, ...	89
— decora, ...	98
— deshaysiana, ...	98
— dubiosa, ...	93
— duttoniana, ...	100
Melania ebenum, ...	93
— edgariana, ...	97
— elevata, ...	69
— excurata, ...	96
— florentiana, ...	99
— fuliginosa, ...	94
— fusiformis, ...	93
— gemma, ...	91
— globula, ...	95
— gracilis, ...	94
— hildrethiana, ...	92
— holstonia, ...	100
— hydei, ...	93
— integra, ...	96
— kirtlandiana, ...	92
— lævis, ...	92
— lecontiana, ...	96
— laqueata, ...	97
— monozonalis, ...	96
— multilineata, ...	97
— nassula, ...	97
— nickliniana, ...	95
— nitens, ...	98
— niagarensis, ...	90
— nodulosa, ...	100
— nupera, ...	97
— obovata, ...	98
— obtusa, ...	96
— ocoeensis, ...	94
— occidentalis, ...	95
— olivula, ...	98
— pillula, ...	99
— prasinata, ...	98
— proxima, ...	99
— potosiensis, ...	99
— pyrenella, ...	99
— regularis, ...	94
— rufescens, ...	93
— rugosa, ...	96
— salebrosa, ...	100
— semicarinata, ...	100
— simplex, ...	100

	Page.
Melania sordida,	94
— striatula,	99
— strigosa,	95
— subcylindracea,	94
— subularis,	92
— subsolida,	94
— sulcosa,	99
— taitiana,	92
— tenebrosa,	95
— terebralis,	95
— teres,	96
— trochiformis,	100
— troostiana,	100
— trilineata,	100
— tuberculata,	93
— undulata,	92
— venusta,	99
— vestita,	100
— virgata,	95
— virginica,	90
— viridis,	95
— warderiana,	99
Mesodesma arctata,	231
— jauresii,	231
Mitriadæ,	151
Modiola americana,	186
— carolinensis,	186
— castanea,	186
— discors,	185
— discrepans,	185
— modiolus,	185
— nexa,	185
— pectinula,	185
— plicatula,	184
Montacuta bidentata,	232
Myadæ,	238
Mya acuta,	240
— arenaria,	240
— truncata,	240
Mytilidæ,	181
Mytilus borealis,	182
— cubitus,	183
Mytilus hamatus,	183
— incurvatus,	183
— lateralis,	183
— leucopheatus,	184
— notatus,	182
— pellucidus,	183
— ungulatus,	183
Natica clausa,	122
— duplicata,	121
— flava,	123
— heros,	120
— immaculata,	122
— pusilla,	123
— triseriata,	121
Nucula acuta,	181
— gouldi,	180
— limatula,	180
— minuta,	181
— myalis,	180
— navicularis,	180
— proxima,	179
— radiata,	179
— sapotilla,	180
— tenuis,	181
— thraciæformis,	178
Odostomia exigua,	116
— fusca,	116
— insculpta,	115
— producta,	116
— seminuda,	115
— trifida,	114
Oliva literata,	152
Osteodesma hyalina,	234
Ostracidæ,	167
Ostrea borealis,	169
— canadensis,	170
— equestris,	171
— semicylindrica,	171
— virginica,	169
Otion blainvilli,	257
— cuvieri,	257
Paludina bimonilifera,	87
Paludina disscisa,	84
— dissimilis,	86
— genicula,	86
— georgiana,	86
— integra,	84
— intertexta,	85
— isogona,	85
— lapidaria,	86
— magnifica,	86
— ponderosa,	86
— subcarinata,	87
— subglobosa,	86
— subpurpurea,	86
— transversa,	85
— vivipara,	86
Pandora trilineata,	239
Panopea arctica,	246
Patella candida,	161
Patellidæ,	161
Patelloida alveus,	162
— testudinalis,	162
Pecten concentricus,	172
— islandicus,	173
— magellanicus,	173
— nodosus,	174
— ornatus,	174
— purpuratus,	174
— varius,	172
Pectinidæ,	172
Petricola dactylus,	228
— pholadiformis,	228
Pholas costata,	248
— crispata,	249
— cuneiformis,	248
— oblongata,	248
— truncata,	248
Pholidæ,	247
Physa ancillaria,	79
— aurea,	80
— concolor,	81
— cylindrica,	77
— elliptica,	77

	Page.
Physa elongata,	81
— glabra,	80
— globosa,	81
— gyrina,	79
— heterostropha,	76
— integra,	81
— obesa,	78
— planorbula,	76
— plicata,	78
— pomilia,	81
— sayi,	81
Pinna muricata,	187
— seminuda,	187
Pirena scalariformis,	128
Pisidium abditum,	226
— abruptum,	226
Planorbis antrorsus,	66
— armigerus,	62
— bicarinatus,	60
— campanulatus,	61
— corpulentus,	64
— deflectus,	65
— dilatatus,	66
— elevatus,	65
— exacutus,	63
— glabratus,	66
— hirsutus,	64
— lentus,	60
— megastoma,	61
— obliquus,	62
— parvus,	63
— trivolvis,	59
— virens,	66
Pleurotoma bicarinata,	149
— decussata,	150
— plicata,	150
Plicatula ramosa,	174
PTEROPODA,	6
Pupa armifera,	52
— badia,	49
— contracta,	49
— corticaria	50
Pupa exigua,	49
— fallax,	51
— milium,	48
— ovata,	50
— pentodon,	50
— rupicola,	52
— simplex,	52
Purpura bizonalis,	136
— floridana,	136
— imbricata,	136
— lapillus,	135
PURPURIDÆ,	130
Pyramis striatula,	114
Pyrula canaliculata,	140
— carica,	141
— papyratia,	142
— spirata,	142
Ranella caudata,	139
Rostellaria occidentalis,	151
Sanguinolaria fusca,	212
— lusoria,	213
— rugosa,	213
— sordida,	213
Saxicava distorta,	257
SAXICAVIDÆ,	226
Scalaria clathrus,	127
— humphreysi,	127
— lineata,	126
— multistriata,	126
— novangliæ,	127
— subulata,	125
— turbinata,	127
SEPIADÆ,	2
Skenea laxa,	117
— serpuloides,	117
Sigaretus haliotoideus,	153
— maculatus,	153
— perspectivus,	153
SIPHONIDÆ,	5
Solecurtus caribeus,	243
— fragilis,	244
Solemya borealis,	246
Solemya velum,	245
Solen ensis,	242
— viridis,	243
SOLENIDÆ,	243
Succinea avara,	54
— campestris,	54
— obliquus,	53
— ovalis,	53
— retusa,	55
Spirula peronii,	5
Tebennophorus carolinensis,	24
Tellina alternata,	211
— decora,	211
— flexuosa,	210
— interstriata,	211
— iris,	210
— lateralis,	210
— mera,	211
— polita,	210
— tenera,	209
— tenta,	210
— versicolor,	209
TELLINIDÆ,	208
Terebra dislocata,	152
Terebratula caput-serpentis,	167
— psittacea,	167
— thalassina,	167
TEREBRATULIDÆ,	166
Teredo navalis,	249
TEREDINIDÆ,	249
Thracia conradi,	237
Tornatella punctostriata,	127
Trichotropis borealis,	137
Tritonia reynoldsi,	8
TRITONIDÆ,	8
TROCHIDÆ,	124
TUNICATA,	258
TURBINIDÆ,	83
Turritella æqualis,	113
— alternata,	113
— concava,	113

	Page.
Turritella erosa,	113
— impressa,	113
— interrupta,	112
Unionidæ	187
Unio alatus,	195
— boydianus,	189
— cariosus,	193
— complanatus,	188
— compressus,	191
— luteolus,	190
— nasutus,	191
— novi-eboraci,	194
Unio ochraceus,	193
— radiatus,	189
— rectus,	195
— rosaceus,	192
— tappanianus,	194
— ventricosus,	190
Valvata sincera,	119
— tricarinata,	118
— unicarinata,	118
— pupoidea,	119
Velutina lævigata,	154
— zonata,	154
Veneridæ,	215
Venus elevata,	219
— fluctuosa,	220
— gemma,	218
— inequalis,	219
— mercenaria,	217
— mortoni,	219
— notata,	218
— preoparca,	219
Vermetus lumbricalis,	116
Vitrina pellucida,	25

ZOOLOGY

OF

NEW-YORK,

OR THE

NEW-YORK FAUNA;

COMPRISING DETAILED DESCRIPTIONS OF ALL THE ANIMALS HITHERTO OBSERVED WITHIN THE STATE OF NEW-YORK, WITH BRIEF NOTICES OF THOSE OCCASIONALLY FOUND NEAR ITS BORDERS, AND ACCOMPANIED BY APPROPRIATE ILLUSTRATIONS.

BY JAMES E. DE KAY.

PART VI. CRUSTACEA.

ALBANY:
PRINTED BY CARROLL AND COOK, PRINTERS TO THE ASSEMBLY.
1841.

TO

WILLIAM C. BOUCK,

GOVERNOR OF THE STATE OF NEW-YORK.

I submit a continuation of a Report on the Zoology of the State.

And have the honor to be,

With great respect,

Your obedient servant,

JAMES E. DE KAY.

LIST

OF

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SYNOPSIS

OF THE

GENERA OF NORTH AMERICAN CRUSTACEA HITHERTO OBSERVED.

I. DECAPODA.

Libinia, Leptopodia, Hyas, Mithrax, Xantho, Panopeus, Platycarcinus, Pilumnus, Carcinus, Platyonichus, Lupa, Pinnotheres, Ocypoda, Gelasimus, Sesarma, Nautilograpsus, Plagusia, Ilia, Hepatus, Lithodes, Hippa, Pagurus, Porcellana, Monolepis, Callianassa, Astacus, Homarus, Crangon, Alpheus, Hippolyte, Pandalus, Palemon, Peneus, Mulcion.

II. STOMAPODA.

Mysis, Diastylis, Squilla, Gonodactylus.

III. AMPHIPODA.

Orchestia, Talitrus, Gammarus, Amphithoe, Cerapus, Lepidactylis, Unciola, Hyperia, Podocerus.

IV. LŒMIPODA.

Cyamus, Caprella.

V. ISOPODA.

Idotea, Stenosoma, Anthura, Sphæroma, Næsa, Cymothoa, Limnoria, Asellus, Ligia, Philoscia, Oniscus, Porcellio, Armadillo, Fluvicola.

VI. PŒCILOPODA.

Polyphemus, Argulus, Caligus, Anthosoma, Pandarus, Cecrops, Lernea, Penella.

VII. PHYLLOPODA.

Apus.

VIII. LOPHYROPA.

Cyclops, Scopiphora.

IX. BRANCHIOPODA.

Branchipus.

X. OSTRAPODA.

Cypris, Cytherina, Daphnia.

THE NEW-YORK FAUNA.

CLASS VII. CRUSTACEA.

OVIPAROUS ARTICULATED ANIMALS, WITH THE BODY DIVIDED INTO MOVABLE RINGS MORE OR LESS DISTINCT; OUTER COVERING CALCAREOUS OR MEMBRANOUS, MORE OR LESS SOLID. MOST COMMONLY A HEART AND BLOODVESSELS, WITHOUT ANY INTERNAL SKELETON PROPERLY SO NAMED. A DOUBLE SERIES OF MEMBERS, SUCH AS ANTENNÆ, JAWS, FEET, etc. ALMOST ALWAYS DISTINCTLY ARTICULATED. EYES VARIABLE IN NUMBER, EITHER SESSILE OR SUPPORTED ON LONG PEDICELS. SEXES DISTINCT. FEET GENERALLY FROM FIVE TO SEVEN. RESPIRATION GENERALLY AQUATIC BY THE GILLS, OR REPLACED BY THE SKIN. INHABIT LAND, OR FRESH AND SALT WATER.

ORDER I. DECAPODA.

Branchiæ lamellar, of a pyramidal form, beneath the body and attached to the sides of the thorax, enclosed in special respiratory cavities. Eyes two, pedunculated and movable. Almost always five pair of ambulatory or prehensile thoracic feet.

Obs. This order is usually divided into two groups, namely, the *Brachyura* and *Macroura*, of which the common Crab and the Lobster stand as the respective types. Recent writers have introduced a third group *Anomoura*, which is intermediate between the two, and forms a passage from one to the other.

GENUS LIBINIA. *Leach. Edwards.*

Shield vaulted, orbicular or pyriform; rostrum notched at its extremity. Eyes scarcely thicker than their peduncles. Exterior antennæ as long as the rostrum; first joint longer than the second. Anterior feet thicker than the others; the pincers closing completely.

Libinia canaliculata.

PLATE IV. FIGURE.

(STATE COLLECTION.)

Libinia emarginata? Leach, Zoological Miscellany, Vol. 2, p. 130, pl. 108.
L. canaliculata. Say, Jour. Acad. Nat. Sc. Vol. 1, p. 77, pl. 4, fig. 1.
L. emarginata. Desmarest, Consid. générales, p. 162.
L. cannelée, L. caniculata. Edwards, Hist. Nat. des Crust. Vol. 1, p. 300.
L. douteuse, L. dubia. Id. Ib. pl. 14, fig. 2.
L. emarginata. Gould, Invertebrata of Mass. p. 328.

Description. Shield globular-pyriform, densely hairy, and usually coated with a thick greenish brown sordes. Rostrum produced, deeply notched at the tip, convex above, concave beneath. Orbits rounded, with a stout spine on the antero-superior border and a smaller one beneath, with an intermediate fissure above and beneath. The shield is impressed above by two deep parallel curvilinear furrows, approaching each other about the middle, then diverging, forming an intermediate oval area, and ultimately approaching each other on the posterior portion of the shield; in front, these furrows curve behind the orbital processes, and terminate at the base of the rostrum. A transverse series of four to six small spinous tubercles across the anterior part of the shield; several others irregularly distributed over the upper surface. Feet long, covered with short dense hair, the second and third pair rather longest, the others successively shorter. Hands sub-cylindrical, sub-compressed, linear. Fingers half as long as the hand, with from twelve to fifteen irregular obtuse teeth, and an impressed lateral line becoming effaced towards the tips. Nails acute, polished, with an impressed line on each side.

Color, soiled greenish or brownish. Hands and fingers reddish white at the tips.

Length of shield, 3·0. Transverse diameter, 2·4.

Length of anterior pair of feet, 5·1; of the succeeding pair, 5·5.

These dimensions are taken from a specimen of the average adult size. Younger individuals 1·4 in length are more pyrifom in shape, are entirely covered with a dense downy hair, and the spine not so prominent as in the adult. In this state I suppose it to be the *L. dubia* of Edwards, which he characterises by "the second pair of feet one and a fourth of the length of the shield, but much longer than the first pair;" while to the *L. canaliculata* he assigns the character of "the second pair one and a half the length of the shield, and slightly longer than the first pair of the male." The *emarginata* of Leach, referred to above, is probably identical with the *canaliculata;* and the name, on the score of priority, should have been retained, had the description been sufficiently detailed.

The *Sea-spider*, or *Spider Crab*, is very common on the coast of this State, and it has been observed from the Chesapeake northwardly, but its precise geographical limits are not known. It is not used as food, but I am assured that it is well flavored, particularly the female. Occasionally they are taken with the seine in such quantities as to be used as manure. Their usual places of resort are on oyster beds, where they are thought to commit great ravages by destroying the young spawn of the oyster.

(*EXTRA-LIMITAL.*)

Genus LEPTOPODIA, *Leach.* Exterior antennæ short. Rostrum slender and much elongated, not emarginate. The second pair of feet much longer than all the others; pincers slender, linear. Eyes not retractile, and on a short peduncle.

L. calcarata. (SAY, Jour. Acad. Nat. Sc. Vol. 1, p. 455. EDWARDS, l. c. Vol. 1, p. 276.) Third joint of the last four pair three-spined at their tips; the middle spine obtuse, and half as long as the next joint. Ocular peduncles slightly projecting before the eyes in an obtuse spine. Length, 1·0; transverse diameter, 0·25. *Charleston, S. C.*

GENUS HYAS. *Leach.*

Shield very tubercular, subtriangular, rounded behind, with the rostrum advanced and emarginate. First joint of the exterior antennæ larger than the second, and compressed and dilated externally. Pincers larger but shorter than the other feet. Eyes on short peduncles; orbits with a fissure above and behind. Feet all terminated with a long conic and somewhat arched nail.

HYAS COARCTATA.

PLATE VII. FIG. 14.

Hyas coarctata.	LEACH, Malacostr. Podopth. Brit. pl. 21, B.
H. id.	DESMAREST, Consid. générales, p. 148.
Lissa fissirostra.	SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 79.
H. coarctata.	MILNE-EDWARDS, Hist. Nat. des Crust. Vol. 1, p. 312.
H. id.	GOULD, Invertebrata of Mass. p. 326.

Description. Shield wide in front, tapering from behind to the orbits, verrucose, and covered with short hooked hairs. External angles of the orbits with a large triangular spine. Rostrum depressed, broad at the base, and deeply cleft. Hands equal, linear, not much larger than the feet, but shorter. The shield strongly coarctate on the sides behind the external orbital angles.

Color, greenish brown; but on the removal of the incrustation, brownish tinged with reddish.

Length, 2·0. Greatest transverse diameter, 1·5.

This Crab, which was first described by Leach, occurs along the coast of Long island, and is found in deep water along the northern coast, where it affords an abundant supply of food to the Cod-fish. It is probably a boreal species, not extending south of the seacoast of New-York.

GENUS MITHRAX. *Leach.*

Shield moderately convex above, longer than broad, and more or less narrowed behind, usually armed with spines. Rostrum short, bifid, and separated by an interval from the internal canthus. Orbits usually armed with spines above and beneath. External antennæ not concealed by the rostrum. Pincers enlarged towards the end, rounded and spoon-shaped.

Obs. We have no type of this numerous genus on our coast, except the following, which is cited by Mr. Say from Delaware bay, and which we think will be found on the coast of this State.

Mithrax hispidus.

Cancer hispidus. Herbst, pl. 18, fig. 100.
Maia spinicincta. Lamarck, An. sans vert. Vol. 2, p. 415, Ed. Brux.
Mithrax spinicinctus. Desm. Consid. sur les Crust. p. 150, pl. 23, fig. 1.
Maia id. Say, Journ. Acad. Nat. Sc. Vol. 1, p. 458.
Mithrax hispidus. Edwards, Hist. Nat. des Crust. Vol. 1, p. 322.

Description. Shield short, convex, with its surface and margin spinous. Rostrum not extending beyond the basal joint of the external antennæ, which are furnished with but two spines; the third joint of these antennæ considerably longer than the second. Upper border of the hands smooth. Pincers with about twenty indentations on the margin, but with no tuft of hairs in the cavity. A series of small points under the tarsus of the four posterior pairs of feet.

This species, of which a specimen exists in the Cabinet of the Academy of Natural Sciences at Philadelphia, from Delaware bay, extends through the Caribbean sea to the coast of Brazil. Its northernmost geographical range is not yet ascertained.

(*EXTRA-LIMITAL.*)

Genus Xantho, *Leach.* Exterior antennæ very short, inserted at the internal canthus of the eyes. Hands trenchant or rounded. A hiatus below the external orbital angle. Shield wider than long, arcuated in front, truncated behind.

X. mercenaria. (*L. id.* Say, Jour. Acad. Nat. Sc. Vol. 1, p. 448. Edwards, l. c. p. 399.) The anterior lateral borders of the shield with four obtuse teeth; front with a slightly sinuous fissure. Feet hairy. *Color*, maculated; fingers black at tip. Length, 3·25; diameter, 4·5. *Charleston, S. C.*

GENUS PANOPEUS. *Milne-Edwards.*

Many of the characters of the preceding genus. The anterior lateral borders of the shield short. A hiatus on the lower border of the orbits, below the external angle.

Panopeus herbsti.

PLATE IX. FIG. 26.

Cancer panope. Herbst, Versuch einer, etc. pl. 54, fig. 5.
C. id. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 58, pl. 4, fig. 3.
Panopeus herbsti. Milne-Edwards, Hist. Nat. des Crust. Vol. 1, p. 403.

Description. Shield transversely oval, granulated on the sides; its surface irregularly furrowed, with a subquadrate elevation in the centre, and another posterior to it. Three or four serrate and apparently truncate teeth on the antero-lateral margins: a small tooth at the external angle of the orbit, above the notch or hiatus. Anterior feet with minute granulations which disappear with age, large, ventricose, subcompressed, unequal: a small pointed tubercle on the inner border of the carpus or wrist. Second segment of the abdomen of the male as long as the two adjacent ones. Feet small and smooth.

Color, blackish brown. Hands yellowish, separated by a defined line from the black finger and thumb.

Length, 0·8. Transverse diameter, 1·1.

This species is commonly known on our shores by the names of *Mud Crab* and *Oyster Crab.* It is frequently taken while dredging for oysters, and is almost invariably found on oyster beds. It is also supposed to be injurious to the Oyster, by feeding on the young spawn. It has not yet been observed, as far as I am aware, north of Cape Cod. On the coast of New-York, New-Jersey and Virginia, it is very common.

Panopeus limosus.

Cancer limosus. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 446.
Panopeus id. Milne-Edwards, Hist. Nat. Crust. Vol. 1, p. 404.

Description. Rather smaller than the preceding, which it greatly resembles. Shield granulated; the antero-lateral margin with three serrate teeth, granulated on their edges, and a fourth anterior and scarcely distinct from the canthus of the orbits. A conic tooth below the anterior tooth of the edge of the shield. Anterior feet equal; carpus with a prominent obtuse spine on the internal surface, but with no angle beneath. Second segment of the abdomen in the male much shorter than the two adjacent ones.

Color, blackish brown; feet olive-green; fingers yellowish white.

Length, 1·0. Transverse diameter, 1·5.

This species is also known as the *Mud Crab*, and appears to have the same geographic range with the preceding.

GENUS PLATYCARCINUS. *Latreille.*

Shield wider than long, rounded in front, truncate behind. First joint of the exterior antennæ small; the second received like the first into a furrow, and scarcely reaching the front.

Platycarcinus irroratus.

PLATE II. FIG. 2.

Cancer irroratus. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 59.
C. id. Bell, Trans. Zool. Soc. Lond. Vol. 1, p. 340, pl. 46.
Platycarcinus id. Milne-Edwards, Hist. Nat. des Crust. Vol. 1, p. 414.
Cancer irroratus. Gould, Invertebrata of Mass. p. 322.

Description. Shield convex, transversely oval, with elevated granulations, and with nine crenate teeth on the antero-lateral margin. (In the female, these are rather indistinct; and the rostrum, if we take the internal canthi into account, is apparently five-toothed.) The lateral teeth often assume the appearance of blunt lobes, which are denticulated on the edges. Rostrum or front three-toothed; the middle one longest, but occasionally obscure. The surface of the shield with distinct granulations, and impressed with irregular furrows, some of which form an appearance resembling the letter H on the posterior portion. Legs shorter than in the following species; "the thighs of the second and third pair not attaining the margin" (*Gould*). Carpus with a robust spine on its inner anterior angle, which is hairy on its edges. Hands compressed, carinate above with serratures; four granulated lines, on the outer side of which two are continued on the fingers; occasionally two others, one above and the other below. Thumb and finger with eight to ten teeth; the finger much curved; the thumb somewhat shortest. Thighs compressed to an acute edge above, where they are hairy, with an elevated band round their tips. Extremities of the claws acute, with deeply impressed furrows. Abdomen, particularly in the female, very hairy.

Color. Above dark horn, with numerous red points which give the prevailing hue. This color extends over the superior part of all the feet; the upper internal parts of the thighs, and the carpus, deep red. Tips of the thumb and finger deep purplish black. Abdomen and inferior portions of the feet white. Furrows on the back dull yellowish.

Length, 3·0. Transverse diameter, 4·0.

This and the succeeding species are both designated by our fishermen as the *Spotted Crab* and *Sand Crab*, and are frequently seen in the months of July and August on the sandy shores of Long island in shallow waters. I have noticed them most abundantly in the markets of New-York about the beginning of April. They are considered inferior as an article of food to the *Lupa dicantha*, or common New-York Crab hereafter described. In individuals from Rhode-Island, larger than the specimen described above, the shell is of a bright indian red, with the finger and thumb deep jet black. They form an excellent bait for the large Black-fish (*Tautoga americana*). Dr. Gould, in the Report above referred to, has

separated from this a closely allied species, which he thinks has been confounded by Say himself with the preceding, supposing one to be the male and the other the female. It appears to have a wide geographical range, for Mr. Randall (*Jour. Acad. Nat. Sc.* Vol. 8) has noticed it on the northwest coast of North America.

Platycarcinus sayi.

Cancer irroratus. Say, Jour. Acad. Nat. Sc. partly, Vol. 1, p. 60, pl. 4, fig. 2.
C. sayi. Gould, Invertebrata of Massachusetts, p. 322.

Description. Shield smooth, less convex and more angular at the sides than in the preceding. The teeth on the antero-lateral margins nine, pointed, smooth, not denticulated. Legs longer in proportion than the preceding; the thighs of the second and third pair greatly exceeding the margin of the shield. Lines on the external part of the hand not conspicuously granulated. Abdominal segment of the male broader than in the preceding species.

Color, yellow, dotted with dark purplish brown. Finger and thumb scarcely dark colored; bend of the wrist and inner face of the hand bright rose-red.

Length, 2·75. Transverse diameter, 4·0.

This species was first separated from the preceding by Drs. Gould and Binney, and has been observed on this coast. According to Dr. Gould, it is common on rocky bottoms, and is brought in considerable numbers to market.

GENUS PILUMNUS. *Leach.*

Shield arched in front. Feet of the first pair unequal. The second joint of the external antennæ lodging in the internal canthus of the orbit, and the antennæ extending beyond the margin of the shield. In other respects, resembling Xanthus.

Pilumnus harrisi.

PLATE VII. FIG. 15.

Pilumnus harrisi. Gould, Invertebrata of Mass. p. 326.

Description. Shield quadrilateral, narrowed backwards, rounded before, rectilinear behind and at the sides. Three triangular teeth at the sides; eyes distant; orbits oval, with a fissure over the centre; front divided by a fissure into two lobes. Surface very minutely granulated, and hispid with very short hairs, which entangle the dirt: there are three or four broken series of curved transverse lines or ridges rising into little crests. Limbs slender, cylindrical. Carpus with a projecting angle in front. Hands robust, smooth, and with a double line along

the upper edge: finger deflexed and furrowed; thumb also furrowed and deflexed. Hands generally unequal; the smaller one sometimes with elevated lines on its outer face.

Color. Hands white within and without.

Length, 0·4. Transverse diameter, 0·5.

I have specimens of this species from the coast of Connecticut, but somewhat larger than the one above described. I have little doubt but that it will be found on our coast. In consequence of having mislaid my notes, I have cited in detail the description given by Dr. Gould, who states it to occur on the Cambridge marshes near Boston, and not unfrequently clinging to floating seaweed in Charles river.

(*EXTRA-LIMITAL.*)

P. aculeatus. (*Cancer id.* Say, Jour. Acad. Nat. Sc. Vol. 1, p. 449. Guerin, Icon. de Cuv. Crust. pl. 3, fig. 92. Laporte, Vol. 2, p. 78. Milne-Edwards, Vol. 1, p. 420.) Hirsute. Shield with about six blackish spines on each side, of which four are on the antero-lateral margin. Front emarginate, and four or six-spined. Orbits three-spined. Arms and feet above with numerous fissures. Shield varied with pale ferruginous. Length, 0·9; transverse diameter, 1·1. *Coast of Georgia and Florida.*

GENUS CARCINUS. *Leach.*

Shield nearly quadrilateral; front advanced. Five teeth on the latero-anterior margin. Ocular peduncles short. Tarsi of the posterior pair narrow, flattened, lanceolate.

Carcinus mœnas.

PLATE V. FIGS. 5 & 6.

Cancer mœnas. Lin. p. 1043.
Carcinus id. Leach, Mal. Podopth. pl. 5.
Cancer granulatus. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 61.
Carcinus mœnas. Milne-Edwards, Crustac. Vol. 1, p. 434, pl. 17, fig. 15, 16. Gould, Invertebrata of Mass. p. 321.

Description. Body and feet granulate; the surface of the shield with a few scattering hairs in front, irregularly impressed as exhibited in the figure, and margined laterally and posteriorly by moniliform lines. Front with three obtuse teeth; the central one slightly advanced. A rounded blunt process under the internal canthus beneath. Sides beneath with long yellowish silky hairs. Carpus with a white acute spine on the inner tip. Posterior pair of feet shortest; all the joints flattened, ciliate on the edges: terminal joint of the last pair falcate-lanceolate, with marginal hairs, and with two deeply impressed lines on the upper and under surfaces.

Color, deep bottle-green behind, where it is spotted with brown; sea-green in front. Beneath, in young individuals, light sea-green; in the adult, tinged with indian red. Body and feet with distant minute spots, arranged on the feet in more or less distinct series.

Length, 1·0 – 1·5. Transverse diameter, 1·3 – 1·8.

This Crab is so insignificant in its economical uses, that it has received no popular name. It occurs abundantly along the rocky shores of Long island sound, among seaweed. At Newport, it is of a larger size, and it appears to become larger northwardly. The *C. granulatus* of Say is passed over in silence in the latest and best treatise on these animals by Edwards, but we have no doubt that it is identical with the *C. mœnas* or common edible crab of Europe.

GENUS PLATYONICHUS. *Latreille.*

Shield nearly orbicular. Front narrow and toothed. The external antennæ of three joints, the first of which is not firmly united to the front, but movable. Second pair of tarsi somewhat flattened, lanceolate; the others acute; the posterior pair oval, and adapted for swimming.

PLATYONICHUS OCELLATUS.

PLATE I. FIG. 1; AND PLATE V. FIG. 7.

Cancer ocellatus. HERBST, Versuch u. s. w. pl. 49, fig. 4.
Platyonichus id. LATREILLE, Encyclopédie, Vol. 16, p. 152.
Portunus pictus. SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 62, pl. 4, fig. 4.
Platyonichus ocellatus. MILNE-EDWARDS, Hist. Nat. des Crustacés, Vol. 1, p. 437.
P. id. GOULD, Invertebrata of Massachusetts, p. 324.

Description. Shield and anterior pair of feet minutely granulate. Front and antero-lateral border with stout spines; five on each side of the shield, including the orbital spines, and one on the front beside the two formed by the inner angle of the orbits. A narrow fissure in the orbits above, and a long oblique spine beneath and internally. Third joint of the external pedipalpi deeply emarginate on its inner side, and elongate and rounded at the tip. Terminal joint of the abdomen very small, pentagonal. Second pair of feet not as long as the first, but longer than the others; the penultimate joint of the third and fourth with two impressed lines on the posterior, and one on the anterior surface. The tarsus of the second more compressed and broader than the first and third; the posterior tarsi oval. Hands large, subequal; the arm extending greatly beyond the margin of the shield, and three-spined on its inner edge. Carpus trigonal, with two spines, of which the internal is longest and most acute. Hand with the outer margin strongly carinate and tubercular; the inner ciliate, and with an acute spine at the inner tip. Thumb trigonal, depressed, with prominent edges, hooked at the tip with from ten to fifteen unequal tubercular prominences: finger straight, somewhat exceeding the thumb, and hooked at the tip. Series of long hairs on the shell, beneath the antero-lateral

margins, on the pedipalpi, anterior and posterior edges of the swimming feet, anterior edge of the carpus, and interior margin of the hand, finger and thumb.

Color. Shell light horn, with numerous reddish irregularly rounded spots having clear spaces in the centre. Hands and feet whitish tinged with reddish, and spotted with dull red. Hands silvery white beneath, bright red on the margins, and with large red spots. Tarsi bluish horn, tipped with reddish: finger and thumb with their tubercles dark red. Beneath, silvery white.

Length, 2·3. Transverse diameter, 2·8.

This beautiful species, of which the specimen described above is one of the largest size, is common along our sea-beaches. Although occasionally eaten, it is not much esteemed as an article of food. By the shore-dwellers, it is often designated as the *Lady Crab*, from the beauty of its colors.

GENUS LUPA. *Leach.*

Transverse diameter of the shield usually more than double its length. Each latero-anterior margin with nine prominent spines, of which the posterior is generally largest, and directed externally and laterally. The external antennæ inserted on the edge of the basillary joint, which moves in a wide cavity under the internal canthus. Abdomen of the male with its two last joints narrow; of the female, wide, with its last joint very small, triangular. Tarsi of the last pair oval, and adapted for swimming.

LUPA DICANTHA.

PLATE III. FIG. 3.

Portunus hastatus. FABRICIUS, Suppl. Entom. Syst. p. 367.
P. pelasgicus. BOSC, Hist. Nat. des Crustacés, Vol. 1, p. 219, pl. 5, fig. 3.
P. dicanthus. LATREILLE, Hist. Nat. des Crust. etc. Vol. 10, p. 190.
Lupa hastata. SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 65.
Lupea dicantha. MILNE-EDWARDS, Hist. Nat. des Crust. Vol. 1, p. 451.
Lupa id. GOULD, Invertebrata of Mass. p. 324.

Description. Surface of the shield with distant granulations, becoming obsolete behind others arranged in four transverse series; two parallel with each other on the anterior part of the shell, and one on each side running to the tips of the long posterior spines. Front with three spines; two on the plane of the shield, and one beneath it. From the base of this last, arise the two internal antennæ, cleft at their tips. External antennæ long, filiform, reaching the fourth lateral spine. Anterior feet large, subequal, with three oblique spines on the anterior edge of the arm, another at the outer tip, and two others near it, obsolete. Hands swollen, sublinear, with five elevated granulated lines and a stout spine at the base, and three others which are often obsolete near the fingers. Fingers incurved, with 12 – 14 unequal tooth-like tubercles in each. Second and third pair of feet subequal; fourth shorter: all the joints of

the posterior or swimming pair ciliated. Outline of the abdominal segments of the male wide at base, but at the fourth joint suddenly narrowed and linear; of the unimpregnated female, pyramidal; of the old female, approaching to spherical.

Color. Back and upper surface of the hands dark green; beneath white. Feet blue, increasing in intensity to the tips. Spines on the shield, callosities and spines on the feet and the tips of the fingers, red.

Length, 2·5. Transverse diameter, 6·0.

This is the *Common Edible Crab* of the United States, being found from Florida to Cape Cod in Massachusetts, beyond which it is rarely seen. It abounds on the muddy shores of our bays, creeks and harbors, and furnishes a cheap and savory food. The process of sloughing or casting their shell occurs annually, and is of short duration, scarcely ever exceeding the period of forty-eight hours from the time of casting its old shell until the new one is firmly consolidated. During this interval, they are known under the name of *Soft-shell Crabs*, or *Shedders*, and are sought after with great avidity. They are considered a great luxury when fried, and are often sold at the rate of two dollars the dozen. In many places, this crab is caught in great abundance to feed hogs. This species frequently ascends streams to brackish water, and Mr. Say mentions having seen them in St. John's river in Florida, one hundred miles from the sea, where the water is potable. Mr. Godman, in his *Rambles of a Naturalist*, has given many curious and instructive details respecting this species, to which we refer the reader.

(*EXTRA-LIMITAL.*)

L. pelagica. Linn. (Say, l. c. Vol. 1, p. 97, 443. Pl. 6, fig. 8 of this work.) Small; front with four small spines; third joint of the anterior feet four-spined; carpus two-spined; hands ciliated on the upper anterior edge. *Color*, greenish varied with brown. Length, 0·8; diameter, 1·2. *Southern Coast.*

L. maculata. (Say, l. c. Vol. 1, p. 445.) Front with fours pines; third joint of the anterior fore feet three-spined before; hands with a strong spine at the base, and five elevated granulated lines, one of which terminates in a short spine at the base of the thumb; second abdominal segment with a spine on each side. *Color*, chocolate-brown, with crowded suborbicular white spots. Length, 2·5; transverse diameter, excluding the lateral spines, 4·0. *Coast of Georgia and Florida.*

GENUS PINNOTHERES. *Latreille.*

Form suborbicular, with the shield soft. Front broad, and covering entirely the internal antennæ. Contour of the mouth semilunar: internal antennæ transverse; external antennæ short, and placed at the internal angles of the orbits.

Obs. This genus, with four others, is included by the most recent writers in a group comprising nine or ten species. They are all small, and remarkable for their singular habit of living within certain marine bivalve shells, chiefly of *Ostrea*, *Mytilus*, *Mactra*, &c. It is also remarkable for the singular transformations it undergoes with age. According to the observations of Mr. Thompson (*Entomological Magazine*, No. 11), it appears that in the *P. pisum* of Europe, when young, the abdomen is much elongated, and ends in a fin; the shell has three large spines; the eyes are much enlarged; the feet dilated for swimming; in short, resembling very much the genus *Zoe*.

Pinnotheres ostreum.

PLATE VII. FIG. 16.

Pinnotheres ostreum.		Say, Jour. Acad. Nat. Sc. Vol. 1, p. 67, pl. 4, fig. 5 (female).
P.	*depressum.*	Id. Ib. Vol. 1, p. 68 (male ?). Young ?
P.	*ostreum.*	Gould, Invertebrata of Mass. p. 328.

Description. Female. Shell rounded, convex, its transverse slightly exceeding its longitudinal diameter, smooth, polished, slightly dilated behind; its texture exceedingly membranaceous. Front not exceeding the line of the shell above. Orbits rounded or subovate; eyes moderate. Hands equal, smooth, with a few short hairs towards the tips, abruptly dilated above the origin of the thumb (see figure). Fingers with a few obsolete tubercles, and slightly curved at the tips. All the articulations of the feet cylindrical; the last joints acute, with an impressed longitudinal line on each. Male or Young. Smaller; shell with a raised marginal line of short dense hair. Front prominent and advanced. Eyes large and prominent; the last abdominal joint smaller than the preceding, and rounded: penultimate joint of all the feet dilated for swimming. *Color*, in both, reddish brown above; whitish beneath, with a dull yellowish transverse band.

Length of female, 0·4; transverse diameter, 0·5.

Length of male or young, 0·1; transverse diameter, 0·13.

We think it extremely probable that the *P. depressum* of Say, is, as he himself suggests, the male, or as we suppose the young, of the *Common Oyster Crab*, as this species is commonly called. Mr. Say never saw but one individual, which he obtained on the coast of New-Jersey; and his notes are silent as to what shell it inhabited, or whether it was in any shell. Some recent writers have hesitated to admit *P. ostreum* as a distinct species. We have, however, made a direct comparison with the *P. pisum* of Europe, the species to which

it is supposed to be most closely allied. The shell of our species is more thin and membranaceous; the abdomen of the female is almost on a line with the front, has a greater transverse diameter, is reddish or yellowish, and the animal is larger. The *P. pisum*, on the contrary, is of a more solid structure, orbicular, very convex, abdomen of the female much shorter, and is of a uniform dull brown or stone-color; the terminal joints of the feet are long and incurved, whilst in the *Oyster Crab* they are short and nearly straight.

This species, or at least the female, is usually found in the common oyster; the male is more rare, and among thousands it is difficult to find one of that sex. They are eaten raw, and considered a great delicacy by epicures.

(*EXTRA-LIMITAL.*)

P. maculatum. (Say, op. cit. Vol. 1, p. 450.) Body covered with very short deciduous dense hair; clypeus obtusely angulated, indented above the tip; two whitish spots. *Color*, black above, beneath yellowish; female dull brownish immaculate. Male, 0·7; female, 0·4. Hab. *Pinna muricata. Southern Coast.*

P. byssomiæ. (Id. Ib. p. 451.) Female. Thorax somewhat transversely oval; clypeus hardly advanced, rounded, entire; hand not gibbous, near base of the thumb; tarsi unarmed. Male unarmed. Hab. (*Byssomia*) *Saxicava distorta* of the Southern coast.

P. cylindricum. (Id. Ib. p. 452.) Body transversely subcylindrical; anterior feet didactyle, equal; second and third pairs nearly equal, and with punctured tarsi; fourth pair very robust, larger and longer than the anterior ones; posterior pairs very small. Eyes approximated. Male 0·3 long, 0·65 broad. Female 0·35 long, 0·75 broad. With the following, types of a new genus. *Georgia.*

P. monodactylum. (Id. Ib. p. 454.) Thorax transversely subelliptical. Hands monodactyle; palm concave and ciliated in the middle; a spiniform angle instead of a finger, with a tooth at its base, and another at the base of the thumb, larger. Male, length 0·3, breadth 0·5. Hab. unknown, but presumed from the coast of America.

Genus Ocypoda, *Fabricius.* Shield subquadrate or rhomboidal; the eyes very large, oblong oval, occupying at least half of the length of the peduncles, and commencing near the base. Feet adapted for walking.

O. arenaria. (Say, op. cit. Vol. 1, p. 69. Edwards, Vol. 2, p. 44, pl. 19, fig. 13. *O. albicans*, Bosc, pl. 4, fig. 1.) Shield very minutely granulated; the edges minutely serrate. Hands unequal, the largest serrate and dentate with spines: the third joint of the second and third pairs of feet without spines; tarsi of the second, third and fourth pair flattened, and enlarged at their extremities. Feet very hairy. Transverse diameter, 1·4. *South-Carolina, Florida.*

GENUS GELASIMUS. *Latreille.*

With the general form of the preceding, but broader transversely, and more narrowed behind.

Eyes small, rounded, and occupying only the extremities of the peduncles.

Gelasimus vocans.

PLATE VI FIG. 9 & 10.

Cancer vocans. Linneus, Syst. Nat.
Ocypode vocans et *pugilator.* Bosc, Vol. 1, p. 197 and 198.
Ocypoda pugilator. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 71.
Gelasimus vocans. Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 54.
G. id. Gould, Invertebrata of Mass. p. 325.

Description. Body broader than long, and broadest in front; lateral margins rounded, but defined by a slightly elevated line which forms with the anterior margin nearly a right angle. The cornea occupies an oblique space nearly at the tip of the peduncle, which is 0·2 long, with scattering solitary hairs; the fossa or furrow for its reception is narrow, nearly straight, and serrated and rounded on its under margin. The antennæ are hairy at their bases. Cheeks densely hirsute; abdominal segments polished, long, sublinear. The enlarged hand occurs indifferently on the right or left, but I think most frequently on the left side, and is often more than twice the length of the transverse diameter of the body. The movable finger is curved, and extends beyond the tip of the other, which is almost straight; from this results a figure somewhat resembling the bow of a violin, and has probably suggested its popular name of *Fidler Crab.* The inner margin of the movable finger has a double series of equal tubercles; the hand is minutely tubercular; the small hand has its fingers equal, and hollowed inwards as if bent: all the feet with rigid hairs.

Color, soiled brown above, with a bluish green mark on the anterior part of the shell; after death, the upper shell becomes polished black, with horn color towards its margins. Eyes black; peduncles light yellowish; hands and feet horn-color.

Length, 0·5. Transverse diameter, 0·6.

Var. a. Smaller and darker colored; the shell is not as ventricose, the anterior border more sinuous, and the posterior margin more narrowed behind (fig. 10); the lateral angles are much more acute, but in other respects I find no important difference.

This species, occupying oblique holes in marshes near the sea, occurs along our whole Atlantic coast as far as Cape Cod. In its movements, which are very rapid, it carries its enlarged hand raised from the ground, and, upon the slightest alarm, elevates it, and extends the fingers in a menacing attitude. This bold demeanor has doubtless given rise to the name of *Soldier Crab.* At the approach of winter, these holes are closed, and the animals remain torpid until the following spring. They appear to be equally at home on land or in water, but seem to spend most of their time on land. They are of little economical use, except as bait for fish, more particularly the Black-fish, or Tautog.

GENUS SESARMA. *Say.*

Shield quadrilateral, elevated in front, where it is broad and curved downwards, reticulated or granulated on the sides. Orbits deeply notched below their outer angle. Third joint of the outer jaw-feet longer than the second, much longer than wide, ovate, slightly subtruncate in front, and having an oblique crest on its outer surface. Tarsi styliform, hairy, and generally wanting spines.

Sesarma cinerea.

Cancer cinereus. Bosc, Hist. Nat. des Crustacés, Vol. 1, p. 204, pl. 6, fig. 1.
Ocypode (*Sesarma*) *reticulatus.* Say, Jour. Acad. Nat. Sc. Vol. 1, p. 73, pl. 4, fig. 6.
Sesarma cinerea. Milne-Edwards, Hist. Nat. des Crust. Vol. 2, p. 75.

Description. Shell somewhat longer in its transverse diameter, with numerous minute irregular punctures, and with oblique scarcely elevated rugæ on each side behind. Cheeks and sides of the body with numerous parallel longitudinal lines of granules, surmounted at regular distances by perpendicular equal hairs; beneath the lateral edge of the shield are about six short ciliate curves, disposed in a longitudinal series. Front deeply hollowed in the middle. Thighs mucronate above near the tip, with minute aculeæ behind, which are wanting on the posterior ones. Tarsi striate with six ciliate lines. Hands subequal, scabrous, with a moniliform edge above.

Inhabits holes in salt-marshes, in the same manner with the preceding. It is found along the shores of the Southern States and among the Antilles, but I am not aware of its having been yet detected on the coast of this State.

GENUS NAUTILOGRAPSUS. *Milne-Edwards.*

The shield shortest in its transverse diameter, convex. Tarsi large and spinous. Third joint of the external jaw-feet not crested. Front lamellar, advanced, not bent over, but simply inclined downward: lateral edges of the shield thin. Legs short; the four posterior pair acute at their tips.

Nautilograpsus minutus.

Cancer minutus. Lin. Herbst, pl. 2, fig. 32.
Grapsus minutus. Latreille, Hist. Nat. des Crust. et des Ins. Vol. 6, p. 68.
G. cinereus. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 99.
Nautilograpsus minutus. Edwards, Hist. Nat. des Crust. Vol. 2, p. 90.

Description. Body small, subquadrate, depressed; the anterior angles acute, with a sinus behind them on the edge. A small spine, more or less distinct, behind the external canthus.

Front entire : third joint of the anterior pair serrate on the inner edge, and four-toothed at the tip. Hands large, granulate beneath. Carpus with an obtuse spine. Tarsi short and spinous beneath.

Color, variable, but most usually brownish, mottled with ash. Eyes reddish brown.

Length, 0·3. Transverse diameter, 0·2.

This little species is usually found upon seaweed, or the larger marine animals in the ocean. It has been noticed on seaweed off the harbor of New-York. But a single species is yet known.

GENUS PLAGUSIA. *Latreille.*

General form of the preceding, but the internal antennæ are short, vertical, and moving in deep cavities which are open above, and formed in the substance of the shield. Mouth nearly closed in front.

Plagusia sayi.

Plagusia depressus. Say, Jour. Acad. Nat. Sc. Vol. 1, p. 100.

Description. Shield with numerous distant punctures, having the appearance of being covered with scales, each of which is bounded before by a line of impressed points furnishing hairs. Sides of the shield with three serrate teeth; the posterior canthus of the eye elevated into a tooth, with a small tubercle within its base. Carpus with a depressed spine within, which is emarginate at tip. Hands granulate above, with small tubercles and two impressed lines. Tarsi with a double line of movable spines beneath; tip of the preceding joint about five-spined beneath.

Color, variegated; tibia darker, spotted; beneath white, immaculate.

Mr. Say received this species from the Gulf stream, and considered it as synonimous with the *P. depressa* from the Indian ocean and coast of China. From this it is distinguished by the hairy tubercles on its shield. I agree with M. Milne-Edwards in considering it more allied to *P. squamosa* from the Red sea and Indian ocean. This latter, however, is characterized by its shield bristling with elevated tubercles, each of which is furnished with a series of stiff hairs directed forward, and resembling scales. It may provisionally, until a direct comparison is made, be considered as a new species, taking of course the name of its learned and indefatigable discoverer

(*EXTRA-LIMITAL.*)

Genus Ilia, *Leach.* Shield oval or circular. Anterior feet very long, slender, and terminating in long filiform fingers.

I. punctata. (Edw. Vol. 2, p. 125. *Leucosia id.* Say, loc. cit. p. 457.) Shield with three long conical teeth behind, directed backwards. Surface granular, terminated by a granulated margin. *Coast of Georgia and Florida.*

Genus Hepatus, *Latreille.* Shield broad, arched in front, narrowed and truncated behind. External antennæ short; the four posterior pair of feet terminated by a small pointed tarsus.

H. fasciatus. (Desmarest, Consid. pl. 9, fig. 2. Say, loc. cit. p. 457.) The antero-lateral margin of the shield divided into 12 – 13 more or less rectangular teeth, which are dentated on their edges. *Color*, variable, yellowish; in the young, banded; in the adult, maculate with reddish spots. *Coast of Georgia and Florida.*

GENUS LITHODES. *Latreille.*

Shield cordiform, tubercular; the rostrum elongated. Eyes approximated, with the four short antennæ between them. The first four pair of feet successively longer; the fifth pair very short and rudimentary.

Obs. This genus is one of a group which forms the transition between the *Decapoda brachyura* and the *D. macroura.* It constitutes the section *Decapodes anomoures* of Milne-Edwards. Of the genus *Lithodes*, we have as yet but one representative on our coast.

Lithodes arctica.

PLATE VI. FIG. 11.

Cancer maia. Lin. Syst. Nat. p. 1046.
Lithodes arctica. Latreille, Genera, Vol. 1, p. 40.
L. maja. Leach, Zool. Miscell. Vol. 1, p. 40. Lam. Vol. 2, p. 414. Ed. Brux.
L. arctica. Lat. in Griffith's Cuvier, Vol. 13, p. 172, pl. 1, fig. 1.
L. id. Milne-Edwards, Hist. Nat. Vol. 2, p. 186. Gould, Invertebrata of Mass. p. 327.

Description. Shield heart-shaped, covered with conical tubercles, and a series of large pointed spines along its lateral margins; the rostrum elongated, slender, bifid, or with two slightly diverging points at the end, two pair of lateral teeth, and one above, and the other larger one beneath the rostrum. Second joint of the external antennæ with a tooth on its outer surface. Pincers with tufts of hairs. All the feet, except the last pair, with series of stout spines.

Length, 4·0. Transverse diameter, 3·5.

This is a boreal species, very common on the coast of Norway. On our coast it is very rare. Dr. Gould obtained, through Dr. Prescott of Lynn, a specimen from the stomach of a codfish on the coast of Massachusetts; and, under similar circumstances, it may present itself to the naturalists of this State.

GENUS HIPPA. *Fabricius.*

Body oblong-oval, convex, truncated in front, with a small triangular rostrum. Tail short, with a lamellar appendix on each side of its base. Hands without pincers, compressed, oval. External antennæ usually rolled up, but, when extended, long and filiform, with a double series of long hairs. Tarsus of the second and third pairs of feet lunated; of the fourth, triangular.

HIPPA TALPOIDA.

PLATE VII. FIG. 17.

Hippa talpoida. SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 160.
H. emerita? MILNE-EDWARDS, Hist. Nat. des Crust, Vol. 2, p. 209. GOULD, loc. cit. p. 328.

Description. Shield with interrupted rugous lines in front, smooth behind. Tail more than half the length of the shield, sublanceolate, with reflected lateral margins; the external spine of the large basal articulation of the external antennæ extends somewhat beyond the globular part of the fourth articulation. Body convex-oval when the tail is inflected upon it, concave above, on the sides, in front, and very convex behind. Immediately behind the rostrum is a deep transversal furrow 0·25 in length, its end turned slightly backwards; a similar furrow, but curved with its concavity forwards, and with a smooth elevated margin, is placed somewhat in advance of the central portion of the thorax. Rostrum small, triangular, with a deep emargination on each side, terminated by a small tooth exceeding somewhat the rostrum. External antennæ longer than the shield, but frequently folded up, and almost entirely concealed between the mouth and the external jaw-feet. Eyes very small, on filiform pedicels. Internal antennæ short. Tail pointed with a double series of hairs. Terminal articulation of the anterior feet oval.

Color, light reddish brown; the shield purple.

Total length, excluding the antennæ, 2·0. Transverse diameter, 0·6. Tail, 0·6.

The original describer of this species, Mr. Say, stated that it was very closely allied to the *H. emerita* of authors; but was of opinion that the great length of the antennæ, and the shape of the tail, indicated a distinct species. Milne-Edwards has, however, in the work cited above, referred it with doubt to the *H. emerita*, and in this he is followed by our distinguished crustaceologist Dr. Gould. In his description of the *H. emerita* from Brazil, M. Edwards says, "L'épine externe du grand article basilaire des antennes externes, *dépassent de beaucoup* "la portion globuleuse formée par le quatrième article pédonculaire de ces organes." An inspection of the magnified figure on the plate, will show that the foregoing phrase does not apply to this species.

This species is known under the popular name of *Sand-bug*, and burrows in the sand between high and low-water mark. The ease and rapidity with which they burrow, has given rise to its trivial name. They are occasionally used as bait. It occurs along the coast of the United States, from near Cape Cod southwardly.

GENUS PAGURUS. *Fabricius.*

Anterior part of the body crustaceous; the lower long and cylindrical, soft, and rolled upon itself. Interior antennæ short, bifid at the tip, and scarcely reaching beyond the peduncle of the external antennæ. Extremity of the tail with an unequal pair of appendices.

Obs. This genus, which is at present subdivided into four others, now comprises nearly fifty species distributed throughout the world. They are all in the habit of occupying the dead shell of a univalve, which is exchanged for a larger one as they increase in size. This singular habit has suggested the popular name of *Hermit Crab.* Some species live on land, occupying of course univalve terrestrial shells.

Pagurus pollicaris.

PLATE VIII. FIG. 21.

(STATE COLLECTION.)

Pagurus pollicaris. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 163.
P. *id.* Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 237.
P. *id.* Gould, Invertebrata of Mass. p. 329.

Description. Anterior segment of the thorax subcordate; truncate behind. Eyes on pedicels 0·3 long, with a small pointed scale at the inner base. Interior antennæ shortest; the penultimate joint extending beyond the ocular pedicels. External antennæ 1·2 long; the last joint composed of about sixty articulations, with a long spinous appendix at its base, nearly as long as the ocular pedicels. Hands unequal, opposed; the right one nearly twice as long as the left, much compressed, crested; the upper ridge convex, dentate; the finger longer than the thumb, with a series of tubercles becoming double towards the angle. Thumb with a stout projection or knob beneath, giving a rectangular appearance to the lower part of this member, and with about eight tubercular teeth. Left hand similar to the right, but wanting the tubercular knob beneath. Both hands, together with the carpus and succeeding joints, strongly tubercular, not hairy. Thighs of the second and third pair smooth below, tubercular above. Carpus of the right not as long as the hand, above rounded; of the left, angular. Terminal joints of the second and third pair slender, nearly equal in length to the two preceding joints, compressed, ciliate on the two edges, with a double series of punctures and a medial impressed line.

Color, red when recent; pearly grey in cabinet specimens.

Length of the thorax, 0·5; of the right hand, 0·8. Width of the same, 0·6.

This is the largest American species that I have seen. It is frequently found in the shell of the *Fulgur carica.* It is rare to meet with a perfect specimen, as they are frequently found deprived of their antennæ, and of one or both their eyes. This is attributed by fisher-

men to the common Black-fish (*Tautoga americana*). I am indebted to my friend Mr. I. Cozzens for an opportunity of examining many individuals of this species. It is sometimes distinguished as the *Warty Hermit Crab.*

Pagurus longicarpus.

PLATE VIII. FIG. 22.

Pagurus longicarpus. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 163.
P. *id.* Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 237.
P. *id.* Gould, Invertebrata of Mass. p. 330.

Description. Thorax for the most part concealed in the shell; its first segment rounded, narrowed and truncate behind; second segment emarginate behind for the reception of the abdomen. External antennæ longer than the left hand, filiform, with an accessory filament on the basal joint; internal antennæ setigerous at the tips. The ocular pedicels equal the first segment of the thorax in length; at the base of the pedicel, on the upper surface, is a small scale, concave above, dilated behind, and pointed in front with a few setæ. Second and third pairs of feet subequal; the two last joints, and more especially the penultimate joint, punctured, with a series of setæ above: the last joint with a lateral impressed line. Hand linear, granulate, with a slightly serrated edge beneath, extending nearly to the tips of the fingers, which are smooth and polished; internally the hand is somewhat ventricose. Carpus equal in length to the hand, long, linear, with a raised moniliform edge on its upper surface, with elevated dots and rigid setæ.

Color. Body dark reddish brown; fingers grey or whitish.

Length of the whole animal, 1·5.

This description is taken from an unusually large specimen; they are, in general, much smaller. It is the most common species on our coast, and may be seen running about our shores with their attached shells. It is known as the *Little Hermit Crab.*

(*EXTRA-LIMITAL.*)

P. bernhardus. (Desmarest, loc. cit. p. 173, pl. 30, fig. 2. Gould, loc. cit. p. 329.) Shell with an elevated medial line. Anterior feet with spinous tubercles. Second and third pair spinous and tubercular above; the last joint very thick, compressed, twisted upon itself, enlarging itself slightly towards the extremity, which suddenly narrows to a point. Carpus as long as the palm of the hand, rough and hairy. *Color*, bright cherry-red. Length, 5·0 – 6·0.

This Pagurus of Northern Europe has been observed by Dr. Gould on the coast of Massachusetts.

P. vittatus. (Bosc, Hist. Nat. des Crustaces, Vol. 2, p. 78, pl. 12, fig. 1.) Pincers nearly equal, tubercular and hairy; the second and third pair robust, with white longitudinal stripes. Thorax short, flattened, slightly dentated in front, and furnished with long hairs. Common on the shores of South-Carolina.

Genus Porcellana, *Lamarck.* Body suborbicular or subquadrate. External antennæ very long, setaceous, placed behind the eyes; the internal concealed in cavities. Anterior feet very large; the carpus very long, with a lamellar prolongation. Posterior pair small and slender, folded over the base of the others, and ending in a small didactyle pincer. Tail fan-shaped, bilamellate on each side.

P. pilosa. (Milne-Edwards, loc. cit. Vol. 2, p. 255.) Shield elongated: front divided into three lobes, of which the central one is triangular and prominent, the others small and rounded; extremities very hairy. Carpus middle sized, and armed towards the base of its anterior edge with a denticulated lobe; a few spines before this lobe. Hands short and wide; the following members almost cylindrical. *Color*, brownish. Length, 0·5. *Charleston, S. C.*

P. sociata. (Say, loc. cit. Vol. 1, p. 456.) Carpus and hand tuberculate before: tubercles very obtuse, each composed of from four to nine granules. Anterior part of the thorax deeply crenate; crenæ inflected: in the two lateral ones are placed the eyes and antennæ; feet hairy. Length of thorax, 0·2. Probably the same with the preceding. *Coast of Georgia.*

P. galathina. (Bosc, Hist. Nat. des Crust. Vol. 1, p. 233, pl. 6, fig. 2. Say, Ac. Sc. Vol. 1, p. 458.) Shield flattened, striated longitudinally; pincers compressed; thighs dentate. This is all the information we have respecting this species. From an inspection of the figure, it appears to have the carpus strongly serrated, and the body and limbs punctate or tubercular; the length 0·4. Bosc states its habitat to be unknown, and Mr. Say merely cites the name, and states it to be common on the coast of Georgia and Florida. Edwards does not cite it, but it may possibly be his *P. pilosa.**

Genus Monolepis, *Say.* Shield convex, oblong, with a small rostrum. Eyes very large and distant. Intermediate antennæ stout, bifid at the end, and concealed under the rostrum. First pair of feet didactyle; the three following monodactyle; the fifth very small, folded over the posterior part of the shield, and terminating in long setæ. Tail ending in three plates. A double series of false swimming feet beneath the abdomen.

Obs. This genus is composed of minute species. M. Milne-Edwards suspects that this and its allied genus *Megalops* may possibly include merely the young of some other crustacean. They form the passage from the *Decapoda anomoura* to the *D. macroura.*

M. inermis. (Say, Acad. Nat. Sc. Vol. 1, p. 157.) Front unequal, extended into a short rostrum, with a tooth on each side near the eyes. A large truncate tubercle behind each eye. Tarsi simple. Hind feet very small, terminated by three setæ. *Color*, olive green. Length of thorax, 0·25. *Eastern shore of Maryland.*

M. spinitarsus. (Say, loc. cit. Vol. 1, p. 58.) Tubercle behind the eyes obsolete. Tarsi armed beneath with about seven rigid spines, of which the fifth is largest and the sixth smallest; the tip incurved, acute. Length of thorax, 0·3. *Coast of South-Carolina.*

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* Dr. Leach (*Nouv. Dict. des Sc.* Vol. 18, p. 51) has arranged this and a few others under a subdivision of *Porcellana*, which he calls *Pisidia*, but which has not been adopted by many subsequent writers. He calls it *Pisidia sayana*, and describes "the shield and pincers marked with short and transverse lines; front trifid, with the elongated medial one itself tridentate and finely granular." The *P. galathina* of Bosc, is supposed by Dr. Leach to be different, and more closely allied to the *sociata*, and he adds the following characters: Shield striate; front smooth and undivided; pincers large, equal, chagrined above, with three very sharp spines on the inside; hands nearly triangular; fingers short, without any dentations within.

Genus CALLIANASSA, *Leach.* Abdomen elongated, membranous. Terminal filaments of the internal antennæ much longer than the peduncle. No respiratory appendices under the abdomen. Lateral plates of the caudal fin foliaceous and very broad. First and second pair of feet didactyle; third pair enlarged towards their extremities.

C. major. (SAY, Journ. Ac. Nat. Sc. Vol. 1, p. 238.) Hands unequal: carpus granulated, trilateral, not concave. Hand much elongated, sublinear, compressed, glabrous. Abdomen membranaceous, of six segments; lateral lamellæ simple, larger than the tail. Length, 4·5. Burrows in sand. *Florida.*

Genus GEBIA, *Leach.* Characters of the preceding, but the first and second pair of feet with a movable finger, and projecting angle for a thumb. Rostrum elongated and broad, concealing the eyes.

G. affinis. (SAY, loc. cit. Vol. 1, p. 241.) Thorax glabrous, covered in front with tufts of hair arising from tubercles. Rostrum short, canaliculate, hairy. Hands not broader than the carpus, linear, nearly equal to the third joint. Length, 2·25. *Coast of Georgia.*

GENUS ASTACUS. *Fabricius.*

Rostrum depressed, wide at base, and with not more than one lateral spine. Lamellar appendix of the external antennæ large; the fifth thoracic ringis articulated with the preceding, and not soldered to them. Six anterior feet didactyle. Exclusively fluviatile.

ASTACUS BARTONII.

PLATE VIII. FIG. 25.

(STATE COLLECTION.)

Astacus bartonii. FAB. Entom. Systematica, Suppl. p. 407.
A. *id.* Bosc, Hist. Nat. des Crust. Vol. 2, p. 62, pl. 11, fig. 1.
A. *id.* SAY, Jour. Acad. Nat. Sc. Vol. 1, p. 167.
A. *id.* HARLAN, Med. and Phys. Researches, p. 230, pl. fig. 2. GOULD, loc. cit. p. 330.
A. *affinis.* MILNE-EDWARDS, Hist. Nat. des Crustacés, Vol. 2, p. 332.

Description. Body with scattered punctures. Rostrum mucronate, concave, elongated, suddenly attenuated, but with lateral angles rather than spines at the point of attenuation. No spines on the thorax. An acute triangular spine, rather exceeding the rostrum in length, articulated to the outer side of the base of the external antennæ; below the base of the spine, on each side, an oculiform tubercle. Movable finger slightly shorter than its opposite, and a number of foveolæ or pits in such a regular series on both as to produce the appearance of one or more elevated lines. Carpus with a deep furrow on its upper surface, and one or more spines on its inner angle. Shield with a transversal lunate furrow. The first segment of the middle caudal lamella with one or two short spines on each side.

Color of the body and claws, greenish brown; tips of the rostrum, of the hands and feet (and sexual appendices of the male), reddish. Lighter beneath.

Total length, 2·0 – 3·0.

This little *Craw-fish*, or *Fresh-water Lobster*, is exceedingly common in most of the mountain streams of this and the adjoining States. It has been noticed by Bosc in Carolina, and by Dr. Gould in Massachusetts. I am not aware of its extreme northern geographic range. Their habits are nocturnal, concealing themselves during the day under stones. They are rarely eaten, except by children in sport, although they are undoubtedly as palatable as their European congener. The following species I have not seen, although it is said to be found in the Delaware. I have searched for it without success in the tributaries of that stream within the limits of this State. Milne-Edwards has made a singular transposition of the names of these two species.

(*EXTRA-LIMITAL.*)

A. affinis. (Say, loc. cit. p. 168 and 443. Harlan, op. cit. p. 230, pl. fig. 3?) Rostrum mucronate, subcanaliculate, two-spined; a spine behind each eye, and a larger geminate one on each side of the thorax; hand and thumb, on the inner edge, scabrous. Length, 3·3. *River Delaware and its tributaries.*

A. blandingii. (Harlan, loc. cit. p. 229, pl. fig. 1.) Rostrum mucronate, canaliculate, slightly notched at the extremity; a spine behind each eye. Arms tuberculated, elongated; fingers slender, unequal; penultimate and antepenultimate legs of the male with an obtuse process at base of the second joint. Length, 3·8. *Marshes and Rivulets of the Southern States.*

A. oreganus. (Randall, Jour. Acad. Nat. Sc. Vol. 8, p. 138, pl. 7.) Body granulated; beak a long slender spine, with a short spine on each side. *Color*, fuscous, with a large reddish spot on each side posteriorly. Length, 4·0. *Oregon Territory.*

GENUS HOMARUS. *Edwards.*

Form of the preceding. Rostrum slender, narrow, and armed with many teeth on both sides. Eyes spherical. Last ring of the thorax firmly united to the preceding. Hands excessively developed. Medial caudal plate with lateral spines. Exclusively marine.

Homarus americanus.

PLATE XII. FIGS. 52, 53.

(STATE COLLECTION.)

Astacus marinus americanus. Seba, Thesaurus, Vol. 3, pl. 17, fig. 3.
A. marinus. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 165.
A. id. Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 334.
A. id. Gould, Invertebrata of Massachusetts, p. 330.

Description. Rostrum narrow, acute, turned up at the tip, with two short spines at its base and posterior to the eyes; two or three spines on each side of the rostrum, followed by a series of minute ones in large individuals; one or two spines on the under side, near the tip;

a small spine on the anterior edge of the thorax. The rostrum is slightly furrowed on its dorsal surface, and a linear furrow extends from it along the medial line to the first abdominal segment. The accessory plates to the peduncle of the external antennæ spinous; the superior with a ciliate lamella. The last abdominal segment with a pencil of hairs on its external angle, and occasionally another on each side of its posterior margin; a single central spine on the under side of the second, third, fourth and fifth abdominal rings. The caudal plates all distinctly pencilled behind; the first segment of the external one denticulate; the central plate rounded behind, with a spine on each side, which disappears in older individuals. Hands compressed, for the most part unequal, owing to their having been casually detached and renewed at different periods; they have from five to nine spines on the inner edge, a rounded tubercle on the upper or inner surface near the joints of the pincers, and a small blunt spine on the superior and posterior surface of the hand. Carpus as in the European lobster, with five spinous tubercles above and another beneath.

Color, olivaceous green above, and in very old individuals verging to deep blackish green; darker spots and blotches over the body, hands and feet, spines and tubercles; sides of the thorax and of the abdominal segments, under side of the hands and the caudal hairs brick red.

Length of the body, 12·0 – 24·0. Weight, 2 – 10 lbs.

The *Common Lobster* is well known, although it has not until recently been well distinguished from the Lobster of Europe. Ours, however, attains a greater size, and is perhaps the largest species yet known among the Crustacea. The average weight may be stated at about four pounds, but I have frequently seen them of the weight of fifteen to twenty pounds. The largest I have heard of, was sold in the Fulton market, and weighed, as I am credibly informed, thirty-five pounds. They are common in our markets during the whole year, but more especially during the summer, when they are most highly relished, selling at from four to eight cents per pound. The smaller ones are derived from the rocky shores of the East river and Long-island sound. The larger individuals are brought to us alive from Fisher-island sound and the rocky coasts north of Cape Cod. Fishermen suppose the small lobster to be a different species, but without any foundation.

There is a variety of the Lobster, termed *Bluebacks*, on account of their dark bluish color. They are derived from the coast about Cape Cod, have comparatively thin shells, and are highly prized by epicures; they are seen chiefly at the commencement of the lobster season in the early part of May. In June, 1840, I saw in the Fulton market a lobster which was of two colors, distinctly separated by a medial line from the tip of the rostrum to the middle extremity of the plate of the tail. On one side the body and all the members were of a light sky blue, and the other of the usual olivaceous green. It was doubtless occasioned by some morbid change in the condition of the animal. The change of color which takes place when this and several other crustacea (but not all) are placed in boiling water, is owing to a peculiar pigment* in the shell, which is usually brownish or greenish, but which changes to red at the temperature of about 190° Fahrenheit, and also by the action of acids and alcohol.

* Lassaigne, Journal de Pharmacie, Vol. 6, p. 171.

The apparent disappearance and reappearance of lobsters in the neighborhood of New-York, and in other localities, which has given rise to many popular fallacies, may be explained by considering the following facts. They naturally diminish rapidly when taken in such vast numbers as we have known them to be, especially when near to a large market. When the fishing ground is apparently exhausted, they are declared to have disappeared. In the mean time they are undisturbed, and allowed to increase, recourse being had to other fishing grounds; and many females, with the impregnated ova, are brought to market, and kept in cars for a longer or shorter period: the young are excluded, and in this way various broods are produced. Many of these are caught at the docks in the vicinity of the markets, but the greater number go on increasing until the word is given that lobsters are again to be found in our waters.

The geographical range of the Lobster does not extend much farther south than the coast of New-York, and ascends to the extremest north. It is taken in comparatively small quantities on the coast of New-Jersey; but I learn from my valued and learned friend Dr. Pickering, that two years after building the Breakwater in Delaware bay, lobsters made their appearance there in great quantities. I know of no other instance where their range has been extended, except by Gen. Pinckney, now deceased, who, about thirty years since, caused a car full of lobsters to be emptied into the harbor of Charleston, S. C. A few of the survivors, or their descendants, were captured about ten years since, but, as I am informed, they were the last.

GENUS CRANGON. *Fabricius.*

Anterior feet monodactyle, and furnished with a spurious finger; second and third pairs very slender, simple; fourth and fifth more robust. Antennæ inserted in nearly the same horizontal line; exterior ones long, setaceous, with a large scale at the base; intermediate ones short, bifid. Gills seven in number on each side of the thorax.

Obs. This genus, established by Fabricius, comprises about six species chiefly from the polar seas. The *C. vulgaris* is the true *Shrimp* of Europe, with which our species is closely allied, and by some writers considered identical.

Crangon septemspinosus.

PLATE VIII. FIG. 24.

Crangon	*septemspinosus.*	Say, Jour. Acad. Nat. Sc. Vol. 1, p. 246.
C.	*id.?*	Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2. p. 342.
C.	*vulgaris.*	Gould, Invertebrata of Mass. p. 331.

Description. Body with seven spines; one on the thorax, and one on each side in the same line; one at the external canthus of each eye, and one beneath on each side. Rostrum not extending to the eyes, obtuse, with elevated margins which form a furrow on each side ex-

tending nearly to the posterior margin of the thorax. Eyes sessile, and resting upon the concave surface of the peduncle of the interior antennæ. Outer antennæ nearly equalling the total length, and furnished with an oblong tapering plate, truncate at the tip, nearly as long as the internal antennæ, with a raised external border, and ciliate on the internal margin with long hairs. Anterior feet with a slender curved claw, opposable to a sharp prominent spine. Second and third pair of feet exceedingly slender; the remainder more robust, and all with simple acute tips. Middle caudal plate simple, conic, concave beneath; outer plates oblong-oval, margined with hairs.

Color, very pale greenish, frequently translucent; the basal plates of the external antennæ, and the caudal plates, punctate with brown.

Length, 1·5 – 1·75.

This is a lively little animal, and known under the popular name of *Bait Shrimp*, being used exclusively for bait. M. Edwards observes that this differs very little from the *C. vulgaris*, or *Common Shrimp* of Europe, but admits that it may probably be a new species. In his edition of Lamarck's *Animaux sans vertèbres*, published subsequently to his work on the Crustacea, he passes it over in silence. Dr. Gould considers the two species as identical; there appears, however, to be a notable difference in the shape of the basillary plates of the external antennæ.

In many parts of Europe, the Shrimp is eaten in great quantities. Our species has a wide geographical range, being found from Florida to the Arctic ocean.

(*EXTRA-LIMITAL.*)

C. boreas. (Phipps, Voyage, p. 194. Muller, Zool. Dan. Vol. 4, pl. 132, fig. 1.) Shell rough, armed along the medial line with a trifid crest. The plate of the external antennæ short and very wide. Second and third pair of feet filiform; feet of the two last pair very large. Medial plate of the tail with seven spines. *Color*, variegated with reddish. Length, 5·0 – 7·0. Stomachs of Cod-fish. *Coast of Massachusetts.*

Genus Alpheus, *Fabricius.* Antennæ arranged in two series, the internal above the external. First and second pair of feet didactyle. Hands of the first pair large and unequal; the three last pair monodactyle. Shield advanced above the eyes. Inhabiting the seas of warm climates.

A. heterochelis. (Say, loc. cit. Vol. 1, p. 243.) Rostrum simple, spiniform, acute, carinate in the middle. Shield smooth, without spines. Larger hand deformed, compressed, abruptly constricted near the fingers on each edge. *Color*, green, with small brownish spots; hand beneath white. Length, 1·5. *Florida, South-Carolina.*

A. minus. (Id. loc. cit.) Rostrum and shield over the eye, forming three spines in front. Larger hand not compressed, inflated. External jaw-feet obtuse at point, and crowned with spines. *Color*: Large hand white, the tip red, banded near the bases of the fingers with white in the female; white tipped with green in the male. Length, 0·8. *South-Carolina and Florida.*

GENUS HIPPOLYTE. *Leach.*

Antennæ arranged in two series. Rostrum large, immovable, lamellar, compressed and dentated. Feet all slender; the two first pair didactyle. Internal antennæ ending in two long threads. Inhabiting all seas, and occasionally found in fresh water.

Hippolyte sowerbyi.

(CABINET OF THE LYCEUM OF NATURAL HISTORY.)

Cancer spinus. Sowerby, British Miscell. pl. 21.
Hypolite sowerbyi. Leach, Mal. Podopth. Britt. pl. 39.
H. id. Desmarest, Consid. sur les Crustacés, p. 222, pl. 39, fig. 1.
H. id. Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 380.

Description. Rostrum short and wide in front, truncated at the end, risng from the posterior part of the shield, with four or five teeth on the part attached to the shield, and with seven or eight small ones on the upper side of the detached portion. The under side of the detached portion with two teeth, of which one almost extends to the tip. Lamellar appendix of the external antennæ large, ovate, and extending beyond the rostrum. The spine-like plate of the peduncle of the internal antennæ very long; the terminal threads of these organs very short. Outer jaw-feet moderate. Anterior feet scarcely exceeding the peduncle of the outer antennæ. The carpus of the second pair divided into seven or eight very distinct articulations. Third abdominal segment with a sharp medial process, advanced over the next segment. Medial caudal plate with six to ten teeth on each side.

Color, light greenish horn.

Length, 1·5 – 2·0.

A specimen of this species is now in the Cabinet of the Lyceum, obtained by Mr. Zabriskie from the stomach of a Cod-fish on the coast of this State.

Hippolyte aculeatus.

PLATE IX. FIG. 31.

Cancer aculeatus. Fabricius, Faun. Grœnlandica, p. 239.
Alpheus id. Sabine, Appendix to Parry's Voyage, pl. 2, fig. 9.
Hippolyte aculeatus. Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 380.
H. id. Gould, Invertebrata of Massachusetts, p. 332.

Description. Shield arched above. Rostrum slender, scarcely exceeding the penduncle of the upper antennæ, and continuing posteriorly until near the posterior margin of the shield. Four or five large teeth on the attached part of the rostrum; three or four very small teeth on the upper edge of its anterior portion, and three on its lower edge. Jaw-feet long, ex-

ceeding the lamellar appendix of the external antennæ, and very wide and truncate at the end. Anterior feet large, and of moderate length. Five pair of spines on the medial caudal plate. Abdominal segments on each side acute.

Length, 1·0 – 1·5.

This species has been obtained by Dr. Gould, rather abundantly, from the stomachs of fishes on the coast of Massachusetts. It is properly a boreal species, and abundant in the polar seas.

GENUS PANDALUS. *Leach.*

General form of the preceding. The first pair shortest, and ending in a slender point; second pair very slender, and didactyle. Twelve branchiæ on each side. Upper antennæ longer than the body, ending in two filaments.

Pandalus annulicornis.

PLATE VII. FIG. 18.

Pandalus annuliformis.		Leach, Mal. Podopth. pl. 40; and Lin. Trans. Vol. 11, p. 346.
P.	*id.*	Desmarest, Consid. sur les Crustacés, p. 220, pl. 38, fig. 2.
P.	*id.*	Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 384.
P.	*id.*	Gould, Invertebrata of Massachusetts, p. 332.

Description. Rostrum as long as the shield, with eight to ten teeth above; lower side of the rostrum with a few teeth near the tip, separated by a smooth interval from others near the base. Feet slender; those of the first pair scarcely exceeding the lamellar appendix of the external antennæ; the three last pair armed with spines.

Color. The antennæ marked with eight or ten reddish rings, as broad as the intervening white spaces.

Length, 3·0 – 4·0.

Found in the stomachs of fishes on the coast of Massachusetts.

GENUS PALEMON. *Fabricius.*

General form of the preceding. The internal antennæ arise above the external ones, and terminate in three filaments. The first two pair of feet didactyle; the second longer and more robust than the first; the remaining feet monodactyle.

Palemon vulgaris.

PLATE IX. FIG. 30.

Palemon vulgaris. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 248.
P. *id.* Milne-Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 396.
P. *squilla?* Gould, Invertebrata of Massachusetts, p. 332.

Description. Rostrum acute, cultrate, dilated, and deepest under the middle, extending somewhat beyond the lamellar appendices of the external antennæ, with eight or nine teeth on the upper edge, and three or four beneath with setæ between them. Shield with two minute spines on the antero-lateral border at the bases of the external and internal antennæ; between the two spines, an obsolete furrow directed backwards. Peduncle of the lamellar appendix with a spine at the exterior tip. Two spines on the first joint of the interior antennæ. The fingers of the first pair scarcely reaching middle of the palm of the second; its carpus with a spine, and longer than that of the second; its fingers hirsute, minute, and nearly equalling the palm. The second pair with its fingers shorter than the palm; carpus shorter than the following joint; hands elongate; finger somewhat deflexed; thumb straight. Medial caudal plate with two movable prostrate spines placed on each side; tip with three or four movable spines. External antennæ two inches long.

Color, light transparent sea-green mottled with brown; ocular peduncles spotted with yellow.

Total length from the extremity of the rostrum, 1·5.

This species is closely allied to the *P. serratus*, or *Prawn* of England, which is there considered as a great delicacy. Our species is usually termed *Shrimp*, or *Big Shrimp*, to distinguish it from the *C. septemspinosus* before described. It is distinguished from the English *Prawn* by the rostrum, which in this latter is bifid at the tip, and greatly exceeds the lamellar appendix of the external antennæ; it is also smooth near the front above, and the animal is from three to five inches in length. It is closely allied to *P. squilla* of Europe (*La Crevette* of the French), which is somewhat larger, with the rostrum straight, and not exceeding the lamellar appendix of the external antennæ. The relative lengths of the fingers of the second pair in the two species disagree; but without a direct comparison of specimens, it is impossible to determine in what particulars they may differ.

The *American Prawn* is common on the shores of this State, and is particularly abundant in creeks and grassy bays in the river Hudson. It has been noticed by Say as far south as Florida, and by Dr. Gould along the coast of Massachusetts. It probably ranges still farther north.

(*EXTRA-LIMITAL.*)

P. tenuicornis. (Say, loc. cit. Vol. 1, p. 249.) Rostrum with about eleven or twelve teeth above, and six or seven beneath. Carpus of the first pair of feet unarmed. Fingers of the larger feet as long or rather longer than the palm of the hand. Length, 1·2. *Northern Coast.*

Genus Penœus, *Fabricius.* General form of the preceding. The three first pair of feet didactyle; the false abdominal feet terminating in two ciliate plates. Medial caudal plate triangular.

P. setiferus. (*P. fluviatilis*, Say, loc. cit. Vol. 1, p. 236. Edwards, Vol. 2, p. 414.) Rostrum serrate above, with about nine teeth above and two beneath. Last abdominal segment and tail carinate. *Color*, white tinged with reddish; abdominal segments greenish yellow spotted with brown; caudal plates tipped with green, the ciliæ red. Length, 7·0 – 8·0. Abundant on the shores of the Carolinas and Florida.

Genus Mulcion, *Latreille.* Body soft; thorax ovoid. Eyes concealed. Internal antennæ conic, inarticulated and very short; lateral ones composed of a peduncle and a filament, without distinct articulations, and without a prominent scale at the base. Feet thread-like, and usually with an appendix at their base; the fourth pair widest.

M. lesueuri. (Latreille, Griffith's Cuvier, Vol. 13, p. 195, but without any details, except that it was collected by M. Bosc in the seas of North America.)

ORDER II. STOMAPODA.

Shield divided into two parts, the anterior supporting the pedunculated eyes and the antennæ. Gills not lodged in thoracic cavities, but exposed and adhering to five pair of appendages, sometimes rudimentary or obsolete. The jaw-feet, and most of the feet, which are more than ten in number, approximating to the mouth on two lines converging behind, and giving rise to the name of the order.

Obs. This order comprises few species, but which differ widely in form. Only a few of these species have been yet observed on our coast.

GENUS MYSIS. *Latreille.*

Body compressed laterally. Six to eight pair of thoracic feet, and furnished with greatly developed palpi, which make them appear double. Mouth placed near the base of the antennæ. No thoracic branchiæ; the false abdominal feet very small, and without branchial appendages.

Obs. The animals of this genus occur in immense multitudes, especially in the northern polar seas. According to Fabricius, they form the principal food of the Whale.

Mysis spinulosus.

PLATE VII. FIG. 20.

Mysis spinulosus. M. Edwards, Hist. Nat. des Crustacés, Vol. 2, p. 457.
M. id. Gould, Invertebrata of Mass. p. 333.

Description. Rostrum depressed, triangular, and about one-third of the length of the ocular peduncles. Peduncle of the internal antennæ thick and very short; the lamellar appendix of the outer antennæ narrow, and ciliated only within and at the end. Medial caudal plate with spines on its sides, and deeply notched at the end; the internal plates of the lateral appendices become gradually narrowed towards the end; the external plates very obtuse (See Desmarest, pl. 40, fig. 6, a.).

Color, brownish; each abdominal ring marked above by a black star.

This is abundant in winter on our coast. It is called *Opossum Shrimp* in England, from the circumstance that it carries a sac under the thorax, in which the eggs are hatched, and where they are carried for some time. It is supposed by more recent writers to be the males only which carry the young in pouches after exclusion, similar to what has been observed in the family *Syngnathidæ* among the fishes. It is also stated to migrate regularly into fresh water, but I have had no opportunity of verifying the fact. It occurs on both sides of the Atlantic.

(*EXTRA-LIMITAL.*)

Genus DIASTYLIS, *Say.* Thorax smooth, six-jointed; the anterior larger than all the others, compressed and rostrated; the four antennæ placed on the same plane. Five pairs of bifid feet; the anterior truncated. Abdomen five-jointed; the first and second with natatory feet. Tail with a single bifid style on each side of the first segment.

OBS. I place this genus where it was supposed by its author to belong. He did not observe the eyes, which he says were probably retractile. All the species of this order, hitherto observed, have pedunculated eyes. It may possibly be the young of some other crustacean.

D. arenarius. (SAY, loc. cit. p. 314.) Thorax minutely crenate on the anterior portion of the sides. Lateral caudal styles divaricated, longer than the tail; terminal style less than half the length of the lateral ones. Length, 0·2. Pools on the coast of Georgia and Florida. See MONTAGU, *Linnean Transactions*, Vol. 7, pl. 6, for *C. scorpoides*, which Mr. Say thinks a congeneric species.

GENUS SQUILLA. *Fabricius.*

Shield divided into three lobes. Lateral appendix of the three last pair of thoracic feet slender and pointed. External antennæ terminating in a broad oval ciliated plate. Second pair of jaw-feet expanded into large lamellar hand-claws, stoutly toothed on the edges.

SQUILLA EMPUSA.

PLATE XIII. FIG. 54.

(STATE COLLECTION.)

Squilla empusa. SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 250.
S. id. MILNE-EDWARDS, Hist. Nat. des Crustacés, Vol. 2, p. 525.

Description. Thorax narrowed in front, dilated behind, and deeply concave on the posterior margin. Surface with a medial longitudinal ridge, and two on each lateral lobe; the interior short, the exterior terminating abruptly before it reaches the posterior rounded termination: an obtuse angle on the side of this lobe, which is not very obvious in the desiccated specimen. Anterior margin with slightly prominent spines. Last joint of the hand-claw slender, with

five long sharp spines along its anterior edge, and ending in an acute spine ; this is received into a corresponding cavity in the edge of the hand, which is pectinated, and has three movable inflected spines near its base. Abdomen with six series of elevated lines arranged in pairs longitudinally ; one pair medial, and the two others lateral ; all becoming more elevated, and ending in small points on each segment as they approach the tail. Last abdominal segment, or tail, longer than broad, with a stout bony medial ridge terminating, before reaching the posterior margin, in a spine ; sides with eight prostrate robust spines directed backwards ; the space on the margin between the third and fourth spines on each side, with six or seven denticulations ; the posterior pair of spines serrated on their edges.

Color, brownish horn ; abdominal segments irregularly blotched with dusky ; caudal lamellæ yellow bordered with blackish ; eyes green.

Length, 4·0 – 6·0.

This species is frequently taken in our waters, but is not common enough to have received a popular name. It occurs along the whole southern coast to East Florida, and is but rarely found beyond the shores of this State. It was observed by Lesueur on the coast of Rhode-Island, but has not, as far as I know, been observed farther north. M. Milne-Edwards, who does not appear to have had an opportunity of examining our species, thinks that it approaches the *S. raphidea* by the lateral angle of the shield, but resembles in other respects the *S. mantis*. With that humble deference to foreign authority which characterizes so many of our naturalists, we shall of course not be surprised to find this very distinct species treated as identical with that of Europe. In those countries where species of the *Squill* abound, they are highly esteemed as food.

GENUS GONODACTYLUS. *Latreille.*

General shape of the preceding genus, but the enlarged jaw-feet not toothed along their edges.

Gonodactylus setimanus.

PLATE VIII. FIG. 23.

(CABINET OF THE LYCEUM.)

Description. Shield oblong, with its side much elongated; a transverse lunate suture on its lower portion in front, with two spinous projecting teeth covering the ophthalmic ring. Internal antennæ long, smooth, and furnished with plumose setæ; external shorter, bifid at their extremities, which are articulated. The penultimate segment of the jaw-foot is flattened, carinate on its upper margin, dilated and furnished with long plumose setæ; beyond this are three segments gradually diminishing in size to the last, which is oblong-oval, plumose on both margins. First two pair of feet didactyle; the two following with the terminal joints flat and rounded, the edges ciliated. The penultimate abdominal segment slightly arcuated, without spines, and with three rounded unarmed fins on each side, of which the inferior is largest.

Color, greyish; tips of the claws of the anterior pair, ciliæ on the extremities of the others, and the fins, black.

Total length, 3·2; of the anterior pair of feet, 1·5.

This species was obtained from the stomach of a Cod-fish in the market. I have to regret that it was too much mutilated to enable me to present its characters more in detail. It is only provisionally placed here, for in many particulars it is much more nearly allied to the family *Erichthidæ*.

ORDER III. AMPHIPODA.

Head separated from the segment which supports the second jaw-feet. Eyes sessile and immovable. Post-abdomen with narrow elongated swimming appendages below, which are striated transversely, and furnished with ciliæ or hairs, and not with scales. Mandibles furnished with a palpus. Body usually compressed, and curved underneath posteriorly. Thorax usually divided into seven segments. Inhabits fresh and salt water.

GENUS ORCHESTIA. *Leach.*

The four anterior feet ending in a compressed claw; that of the second pair being much larger, its terminal joint long, arched, and applied to the sharp edge of the hand: this edge, in the female, has a single tooth.

Orchestia longicornis.

PLATE IX. FIG. 28 & 28 a. Female.

(STATE COLLECTION.)

Talitrus (*Orchestia*) *longicornis.* Say, Jour. Nat. Sciences, Vol. 1, p. 384.
Orchestia *id.* Gould, Invertebrata of Mass. p. 334.

Description. Eyes oval. Lower antennæ longer than the body; the third joint, under the lens, armed with series of short spines; the fourth joint with about thirty articulations, minutely spinous beneath. Second pair of feet with the hands dilated, oval, smooth, with two obtuse spines on the anterior margin; one at the lower angle, and the other more elevated in the middle: the thumb much curved, acute at its tip, which rests on the interval between the two tubercles (see fig. 28, a.). The two posterior pairs of feet longest. Upper pair of antennæ short, not extending beyond the second joint of the lower pair.

Length, 0·5 – 1·0.

These small crustaceans are well known under the name of *Sand-flea*, or *Beach-flea*, occurring along the shores of Long island, digging holes in the sand in which they conceal themselves, and living upon dead animal substances. They furnish an abundant supply of food to the numerous birds found along that coast.

Orchestia gryllus.

PLATE VII. FIG. 19.

(STATE COLLECTION.)

Talitrus gryllus, Bosc, Hist. Nat. des Crustacés, Vol. 2, p. 152, pl. 15, fig. 2.
T. (Orchestia) id. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 386.
Orchestia id. Gould, Invertebrata of Mass. p. 334.

Description. Lower antennæ much shorter than the body, slightly hairy, but not rugose upon the third peduncular joint; last article with about twenty-five articulations. Anterior pair of feet with a prominent obtuse tubercle on the antepenultimate joint; penultimate joint dilated into an obtuse tubercle at the inner tip to receive the thumb. Palm convex so as to receive the thumb without an interval, as long as the lower edge of the hand.

Length, 0·5 – 0·6.

Habit of the preceding, and abundant along the sandy beaches above the influence of the tide.

GENUS TALITRUS. *Latreille.*

Body composed of thirteen segments, exclusive of the head. Third articulation of the lower antennæ longer than the preceding two united. Upper antennæ scarcely longer, or not as long as the peduncle of the lower antennæ. No feet in the form of a claw; the second pair not larger than the first.

Talitrus quadrifidus.

PLATE IX. FIG. 27.

(STATE COLLECTION.)

Description. Head compressed; eyes obliquely oval. Lower antennæ shorter than the body, and only reaching as far back as the fourth segment, slightly hairy and somewhat rugose on the third joint. Upper antennæ very short, scarcely exceeding the second joint of the lower ones. Body compressed. Tail with three appendices terminating in four spines, each furnished with a series of rigid setæ. All the feet armed with a slender acute claw.

Color, dark horn; eyes blackish brown.

Length, 0·3 – 0·5.

This species also passes under the name of *Beach-flea,* and is frequently found concealed under stones and seaweed.

GENUS GAMMARUS. *Fabricius.*

Antennæ with the last joint composed of numerous minute ones; upper antennæ as long or longer than the lower, with four articulations, the last ending in a bristle; lower antennæ with five articulations. Feet fourteen; the two anterior pair monodactyle, subequal; the two following pair terminate in a simple curved nail. Tail with small fasciculate spines above, and bifid ones at the tip.

GAMMARUS MINUS.

PLATE IX. FIG. 29.

Gammarus minus. SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 376.

Description. Body incurved, subcompressed. Upper antennæ longest, with the setæ short, attaining the tip of the second articulation of the terminal joint, which has about twelve articulations. Eyes reniform.

Color. Body whitish, with a few pale fulvous spots on the sides. In dried specimens, the color becomes reddish, and the lateral spots, more particularly towards the tail, are bright red.

Length, 0·15 – 0·3.

This species is common in most of our fresh-water streams, and may often be detected under stones and pieces of wood. It is extremely active, and is popularly known under the name of *Fresh-water Shrimp.*

(*EXTRA-LIMITAL.*)

G. mucronatus. (SAY, loc. cit. p. 376.) Antennæ subequal. Eighth, ninth and tenth segments of the body mucronate above, more distinctly on the female. Length, 0·4. This and the succeeding will in all probability be found in this State. Inhabits the coast from New-Jersey to Florida.

G. fasciatus. (ID. Ib. p. 374.) Eyes at the outer base of the antennæ, reniform; terminal joint of the upper antennæ with about thirty articulations. *Color*, whitish, fasciate with faint green which becomes reddish after death. Length, 0·4. Fresh water. *Pennsylvania.*

G. locusta. (MONTAGU, Lin. Tr. Vol. 9, p. 359, pl. 4, fig. 1. GOULD, loc. cit.) Eyes linear, almost lunulated; antennæ covered with hairs; threads of the caudal appendices subequal. Allied to the preceding. *Massachusetts.*

G. appendiculatus. (SAY, l. c. p. 377.) Caudal segments, and three terminal segments of the body, dentated on their posterior edges. Feet in one sex with the second pair didactyle. Length, 0·3. *Georgia.*

Genus Amphithoe, *Leach.* General characters of the preceding. No setaceous appendix to the third joint of the upper antennæ. Tail without fasciculated spines, armed with bifid spines at the tip. Hands of the two anterior pair oval. Inhabiting fresh and salt water.

A. serrata. (Say, l. c. p. 383.) Antennæ equal, short, stout; eyes large, approximated, suboval; eighth, ninth and tenth segments of the body serrated; three spines on the lower edge of the palm. Length, 0·4. *Egg harbor, New-Jersey.*

A. dentata. (Id. Ib.) Posterior edge of the dilated thighs strongly serrated; eyes distant above; clypeus obtuse; hand truncate at tip, destitute of prominent teeth, but with a few rigid hairs. Length, 0·3. Fresh water marshes. *South-Carolina.*

A. punctata. (Id. Ib.) Lower antennæ nearly as long as the body; hands oval, not dentated nor larger than the carpus. Body and antennæ sprinkled with black points. Length, 0·35. *Egg harbor, New-Jersey.*

Genus Cerapus, *Say.* Antennæ very large and robust, nearly equal; the upper of four joints, the lower or lateral ones of five. Anterior pair of feet small, monodactyle; the second pair with a broad palm and a two-jointed thumb. Head distinct, ending in a small rostrum.

C. tubularis. (Id. p. 49. *C. abditus*, Templeton, Tr. Ent. Soc. Lond. Vol. 1, pl. 20, fig. 5. See Pl. 10, fig. 43 of this work.) Head with a mucronate carina before; hand and first joint of the thumb with one or two obtuse teeth; eyes oval, black. *Color.* Body above blackish, with irregular paler spots; antennæ and feet white; joints tipped with blackish: two hind pair of feet and tail white. Inhabiting a membranous tube open at both ends. Length, 0·25. *Sea-beach, Egg harbor, New-Jersey.*

Genus Lepidactylis, *Say.* Upper antennæ with a setaceous appendix at the tip of the third joint. Head produced into a point. Body compressed, oval. Feet fourteen. Two anterior pair of feet simple, equal; third and fourth subequal, didactyle, fingers lamelliform; the remaining pairs spinous, without nails.

L. dytiscus. (Say, l. c. p. 380.) Eyes orbicular; setaceous appendix reaching the tip of the fourth segment of the terminal joint; anterior pairs of feet hairy. *Color:* Body, when recent, white, with a ferruginous short stripe within. Length, 0·15 – 0·25. *Coast of Georgia.*

Genus Unciola, *Say.* Upper antennæ robust, subpediform, with an articulated seta at the base of the fourth joint. Feet fourteen, of which the first pair are monodactyle, the second with adactyle compressed hands with two minute hooks at the tip; coxæ simple, not dilated. Allied to *Podoceras.*

U. irrorata. (Id. Ib. p. 389.) Eyes conspicuous, rounded. Hands of the anterior feet with a longitudinal palm and prominent tooth; those of the second pair compressed, ciliated, with a subtriangular hand. *Color*, when recent, pale with numerous red points. Length, 0·3. Hab. seaweed on the coast of New-Jersey.

Genus Hyperia, *Latreille.* Body subconical, short. Head moderately large, round and pointed in front. Antennæ short and setaceous. Feet simple, terminating in a slender point, and subequal. Three first rings of the abdomen very large; the four following very small, and forming a sort of caudal fin furnished laterally with three pair of long and slender appendices, each terminating in two very minute lanceolated plates. Parasitic.

H. latreilli. (Edw. An. Sc. Nat. Vol. 20, p. 388. Say, *Lanceola pelagica*, Ac. Sc. Vol. 1, p. 318. Gould? loc. cit. p. 335.) Anterior pair of feet shortest; third, fourth and seventh equal; fifth longer; sixth longer than the thorax. This species is probably the same noticed by Dr. Gould under the name of *H. galba*, Mont., as occurring in the pouches of the *Medusa* ——, on the coast of Massachusetts. Mr. Say's specimen was obtained from the Gulf stream.

Genus Podocerus, *Leach.* Antennæ pediform; the lower longest and much more robust, with the terminal joint inarticulate or obscurely jointed. The two anterior pairs of feet monodactyle; hands dilated; those of the second pair largest, the palms unarmed. Allied to *Corophium.*

P. cylindricus. (Say, Jour. Acad. Nat. Sc. Vol. 1, p. 387.) Hands of the second pair not larger than the carpus, somewhat cylindrical; third, fourth and fifth pairs of feet short, much compressed. Eyes small, not prominent. Length, 0·15. Hab. seaweed. *Egg harbor, New-Jersey.*

ORDER IV. LŒMIPODA.

Head united to the first segment of the thorax. Eyes sessile. Branchial apparatus, or what is presumed to be such, vesicular, and from four to twelve in number. Abdomen rudimentary, having the form of a small tubercle, without distinct appendices. Marine.

GENUS CYAMUS. *Latreille.*

Body broad, depressed. Head short, truncate. Antennæ four, approximated at their bases; the two upper setaceous, longest. Feet twelve, of which eight are perfect, and the others in the form of slender jointed appendices under the second and third segments of the body. Two compound sessile eyes on the anterior and lateral portions of the head, and two others, smooth, on the vertex. Parasitic.

Cyamus ceti.

PLATE VI. FIG. 14.

Oniscus ceti. Lin. Syst. Nat. 3011.
Cyamus id. Latreille, Gen. Crustac. Vol. 1, p. 60.
C. id. Gould, Invertebrata of Mass. p. 335.

Description. Head small, conical. Body depressed, oval-orbicular, composed of six segments somewhat distant from each other; the last with a small terminal appendix. Antennæ of four articulations, the last of which is small and conic; the upper as long as the head and first segment. Mouth with the lower lip formed by two jointed unguiculated palpi. First pair of feet short, of six articulations terminating in a hand with movable curved claw. Second and third pairs replaced by slender appendices, at the bases of which are the branchial vesicles. Fourth, fifth and sixth pairs complete; the fourth largest, the others successively smaller, all robust; the first joint large and rounded, the penultimate oval, the last pointed and forming with the preceding a monodactyle claw. *Color*, yellowish white.

Length, 0·5 – 0·8.

This species, which is known under the name of *Whale Louse*, is usually found attached to the bodies of whales along our coast, and occasionally on tunnies and other large marine animals. It varies much in form according to its degree of development, and this has given rise to several nominal species, which have not yet been sufficiently examined.

(*EXTRA-LIMITAL.*)

C. abbreviatus. (Say, Jour. Ac. Vol. 1, p. 393.) Hands of the second pair with the palm two-toothed and much larger than the others; one tooth near the base, and the other near the tip. Branchial vesicles half as long as the feet. Length, 0·1. Hab. *Bal.*

GENUS CAPRELLA. *Lamarck.*

Body linear or filiform, composed of unequal segments. The upper antennæ with the last segment many-jointed, and as long as the three others. Two sessile compound eyes. Feet ten, elongated, arranged by pairs in an interrupted series, unguiculated; the second and third segments furnished with branchial vesicles. Marine.

Caprella geometrica.

C. geometrica. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 390.

Description. Body smooth above. Head obtuse, with a short spine in front; three last segments of the body shorter, convex above; terminal one smallest, and truncate at the tip. Second pair of feet with dilated oval compressed hands armed with teeth; one of which is near the base, linear, and almost parallel with the palm; the other large, obtuse, little elevated, placed near the base of the claw: thumb curved, attenuated at the tip, where it closes on the posterior tooth. Branchial vesicles short, oval. Terminal pair of feet longest.

Color. Body with a few scattering reddish brown spots; eyes red; antennæ and feet annulate with reddish brown.

Length, 0·3.

This species is found among sponges and seaweed along the coast, on which it walks after the manner of some caterpillars called *Measuring worms.* It swims by alternate curvatures of the body. Dr. Gould has indicated two species on the coast of Massachusetts, which are very probably distinct from any hitherto described.

(*EXTRA-LIMITAL.*)

C. ——. (Gould, Mass. Rep. p. 335.) Delicate, without any spines on any part. *Color*, thickly dotted on the back with dark green. Length, 0·5. *Massachusetts.*

C. sanguinea. (Id. Ib. p. 335.) Head blunt. Lower antennæ ciliated, and extending to the second segment, and the upper ones to the third segment: a spine on the middle of the first segment. Two last segments short and heart-shaped. *Color*, bright crimson. Length, 1·0. *Coast of Massachusetts.*

C. equilibra. (Say, l. c. Vol. 1, p. 391.) First and second segments of the body equal to one half of the whole length. Second pair of feet placed in the middle of the body. Hand toothless: nail closing without an interval. Second pair very large; the hand oblong-oval; palm rectilinear, bidentate. Length, 1·0. *South-Carolina.*

ORDER V. ISOPODA.

Body more or less depressed, divided into segments varying in number from three to seven. Head distinct from the first segment of the body. Mandibles without palpi. Mouth with three pair of jaws. Feet ten to fourteen. Tail of one or more segments, supporting the branchiæ. Eyes sessile.

GENUS IDOTEA. *Fabricius.*

Body oblong-ovate. External antennæ moderately long, setaceous; the peduncle with four joints, and the extremity many-jointed: internal antennæ placed slightly above the outer, small, filiform. Head subquadrate. Two sessile eyes. Tail large, of three segments, the last without any terminal appendices, and covering the branchiæ and the two laminæ which protect them. Feet subequal.

IDOTEA CÆCA.

Idotea cæca. SAY, Journ. Acad. Nat. Sciences, Vol. 1, p. 424.
I. id. GOULD, Invertebrata of Mass. p. 337.

Description. Body oblong-oval, broadest at the third or fourth segment, attenuated behind. Head quadrate, depressed, with a deep fissure on the sides. Antennæ approximated at the base. First segment of the tail short; second somewhat trilobate; last segment nearly or quite half the length of the body, attenuated to an acute conic point, subcarinate above. Three anterior pairs of feet robust, monodactyle; the remainder simple, unarmed, and with rigid hairs. Nails of the hind pairs rectilinear. Eyes inconspicuous.

Color, whitish varied with brown dots, occasionally confluent into bands; eyes milk white; head with a transverse black band.

Length, 0·3 – 0·5.

This little species occurs on all sandy shores from Massachusetts to Florida, where it forms the little serpentine tracks noticed in the sand. The figure of the *I. tricuspis* of Europe (Pl. 9, fig. 35), is introduced to illustrate the genus, as no opportunity has presented itself of figuring the American species.

(*EXTRA-LIMITAL.*)

I. triloba. (Say, l. c. Vol. 1, p. 425.) Body oval, somewhat oblong; its segments with the lateral processes very convex, lobated. Eyes very prominent. Middle lobe of the tail the largest; the last longer than all the others together, subtriangular. Feet armed with very strong acute incurved nails. Length, 0·25. *Egg harbor.*

GENUS STENOSOMA. *Leach.*

With the general characters of the preceding. Body sublinear. External antennæ nearly as long as the body, not comprising the tail; internal antennæ very short. Feet robust.

Obs. This genus has been united by recent authors with the preceding.

Stenosoma irrorata.

PLATE X. FIG. 42.

(STATE COLLECTION.)

Stenosoma irrorata. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 423.
S. id. Gould, Invertebrata of Mass. p. 338.

Description. Body oblong, somewhat tapering at each extremity, and composed of seven segments; those in the midde of the body largest; no appearance of articulation on the sides of the second or following segments. Eyes prominent, brilliant, black and lateral. Tail of four segments; the three first small, subequal; the third obsolete above. The fourth or terminal segment is nearly as long as four of the body segments, obsoletely carinate on the dorsal surface; tip with an elongated central point, and an obtuse tooth on each side. Lateral appendices oblong, rounded, with a transverse articulation near the posterior tip. Feet multiarticulate, hispid at the joints with acute incurved claws. External antennæ scarcely exceeding in length the ultimate segment of the tail, with a minute spine on the inner side of the tip of the first joint; but this is not observable except in the largest specimens. Internal antennæ very short, scarcely reaching the tip of the third joint of the outer antennæ. The last joint of the exterior antennæ is composed of more than twenty articulations.

Color, varies from deep purple to sea-green and even reddish. Some are of a uniform color, whilst others are varied with light sea-green and cinereous brown. The specimen figured in the plate, represents one with two longitudinal sea-green bands. Scarcely any two individuals are alike in their markings.

Length, 0·2 – 1·0. Width, 0·03 – 0·05.

This beautiful and active species is seen swimming with a rapid vibrating motion in clear salt water, in recesses among the rocks. It appears to be most abundant in August and September. As far as we know at present of its geographical distribution, it is found from Boston harbor to Cape May, but it probably extends along our whole coast.

(*EXTRA-LIMITAL.*)

S. filiformis. (Say, l. c. p. 424.) Body very much elongated, linear; segments distant, emarginate each side. Eyes very prominent. Antennæ robust; outer more than half the length of the body; the last joint enlarged. Length, 0·4. *Egg harbor.*

GENUS ANTHURA. *Leach.*

Body oblong-linear, vermiform. Tail furnished with foliaceous laminæ on each side; penultimate segment very short, the last much longer. Antennæ short; the intermediate ones rather shortest. Anterior feet with a movable nail.

Anthura gracilis.

PLATE IX. FIG. 34.

Oniscus gracilis. Montagu, Tr. Lin. Soc. Vol. 9, p. 366.
Anthura id. Leach, Desm. Consid. Crustacés, p. 291, pl. 46, fig. 13.
A. id. Gould, Invertebrata of Mass. p. 338.

Description. Body elongated. Feet subequal; the second pair smallest; the first pair largest, robust, terminating in a small subcheliform hand. Two pair of foliaceous elongated laminæ on each side of the last caudal segment, which is subtruncate behind.

Length, 0·25.

(*EXTRA-LIMITAL.*)

Genus Sphæroma, *Latreille.* Body oblong, convex, with subimbricated transverse segments, and contractile into a sphere. Antennæ four, small; the external slightly longest. Tail of two segments; the last with a fin on each side, formed of two scales. Marine.

S. quadridentata. (Say, l. c. p. 400.) Body oval, punctured. Tail with its last segment semioval; the internal lateral lamella acute, entire; the external one serrate on the outer edge with four teeth. *Color*, brownish ferruginous, often varied with white or rosaceous. Length, 0·45. ***Coast of Georgia and Florida.***

GENUS NÆSA. *Leach.*

Body ovate-oblong, with many of the characters of the preceding. Last segment of the tail largest, and furnished on each side with a simple pedunculated appendix; penultimate joint of the thorax larger than the last. Nails bifid.

NÆSA OVALIS.

Næsa ovalis. SAY, Jour. Acad. Nat. Sciences, Vol. 1, p. 484.

Description. Body oval, depressed. Caudal segments three; the last half as long as the body, triangular, obtusely rounded at the tip, with three longitudinal raised lines at the base, of which the middle one is most conspicuous. Lateral processes dilated, depressed, rectilinear within, and rounded on the external margin. Head somewhat unequal. Eyes conspicuous, hemispherical. Antennæ equal. Labrum triangular, advanced, very conspicuous, and forming with the base of the superior antennæ a rounded termination. Feet all armed with bifid nails, none of which close on the preceding joint.

Length, 0·15.

According to Mr. Say, this species, which I have not seen, is common in the bays and inlets of the United States, creeping on seaweed and other marine plants. It occurs as far south as Florida.

(*EXTRA-LIMITAL.*)

N. caudata. (ID. Ib. p. 482.) Body oblong-oval, semicylindrical. Last segment of the tail tuberculated, as long as the four preceding ones united, with a deep sinus at the tip, within which are two to four teeth, and a larger vertical one above its base. First caudal segment conspicuous. *Color*, fuscous. Length, 0·25. *Egg harbor, N. J.*

N. depressa. (ID. Ib. p. 483.) Body broad, depressed, punctured, linear. Hands of the anterior feet dilated, ovate, monodactyle; thumb as long as the palm. Second pair with cylindric hands, with an incurved thumb; the others ciliated. First caudal segment concealed. Length, 0·5; breadth, 0·2. Hab. with the preceding.

GENUS CYMOTHOA. *Fabricius. Lamarck.*

Body oval, oblong, subconvex, of six transverse segments. Tail of six segments, narrower than those of the body; the last segment largest, and having on each side a fin composed of two compressed scales. Feet fourteen, with stout nails; the coxæ large, and resembling an accessory lateral articulation of the thoracic segments. Two sessile eyes. Antennæ four, setaceous, rather short; the external slightly longest.

Obs. This large genus has been erected by recent writers into a family composed of ten genera. We retain at present the original genus *Cymothoa*. The species are all parasitic, being attached to the mouths and gills of fishes.

Cymothoa triloba.

PLATE X. FIG. 40.

(STATE COLLECTION.)

Description. Body elongate, elliptic; the transverse more than half the longitudinal diameter of the body. First segment as broad on the medial dorsal line as the two following segments united; it is emarginate on its anterior edge, to correspond with the trilobed division of the head: its accessory lateral plate united so closely as to form a continuity with the segment; last segment lunate. Surface of all the segments smooth, with irregular opaque marks; the posterior margins opaque, polished. Head ovate in front, where it is slightly reflected downward, trilobed behind; the middle lobe largest. Eyes inconspicuous. Anterior pair of antennæ shortest. Segments of the tail gradually decreasing in breadth, with an obsolete elevation on the medial line; terminal segment equal in length to the five preceding, subquadrate, narrowed and rounded behind, with a membranous tip, and a faint elevated transverse line on the upper surface. Lateral appendices about equal in length to the terminal segment; the external lamella longest.

Length, 1·0. Extreme breadth, 0·6.

This species has many characters in common with the *C. impressa* of Say; but (independent of marked differences) his doubts whether it might not be synonimous with *C. ichthyola*, Latr., induces me to believe that he had in view a species entirely distinct from that described above. It differs from *C. oculata*, Say, by the conspicuous eyes and the size of the middle lobe of the head in the latter species. I am unacquainted with the *C. trigonocephala* of Leach, except by a brief notice in the *Dictionnaire des Sciences Naturelles*.

This species is very common on various fishes. The specimen here described was detached from the surface of the Common American Codfish.

Cymothoa prægustator.

Oniscus prægustator. Latrobe, Am. Phil. Trans. Vol. 5, p. 77, Pl. 1.
Cymothoa (Æga) id. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 395.

Description. Body ovate, elongated, gradually tapering before from the sixth segment; the first four segments nearly equal in length; the three following shorter. Head not tapering, elongated, much longer than broad, transversely impressed near the tip, which is not narrowed. Eyes conspicuous, oval, composed of punctures instead of granules. Antennæ subequal, hardly attaining the middle of the eyes. Last segment of the tail as long as the seven preceding ones united, gradually narrowed towards a point at the tip, with a perceptible longitudinal line on the middle. Lateral styles membranaceous, almost filiform, longer than the peduncles, and much shorter than the segment to which they are attached. Feet gradually longer to the seventh pair, which are much longer than the others.

Length, 2·0.

This species is very abundant in the mouth of the *American Alewife* (*Alosa tyrannus* of the New-York Report).

Cymothoa olivacea.

PLATE X. FIG. 41, 41 a. Magnified.

Description. Body oblong-oval, attenuated in front, smooth; the transverse equal to half the longitudinal diameter. Head pyramidal, rounded anteriorly; first segment with three emarginations, of which the central is most superficial. Bases of the antennæ contiguous, of eight articulations each, the anterior slightly longest. Eyes black, reticulated, conspicuous. First segment broader than the following, and without an accessory lateral plate; third and fourth subequal; fifth, sixth and seventh broader, the last lunate. Segments of the tail smooth, with no elevated medial line. Terminal segments subacutely ovate; lateral appendices longer than the terminal segment. Three last pairs of feet longest.

Color. The three anterior segments olive-green; all the others sparsely punctate with white, and of a polished white on their posterior margins. Segments of the tail black. Abdomen tumid, and of a rich olive-green or yellowish.

Length, 0·75.

I found numerous specimens of this species in the month of August in the harbor of New-York, adhering to the gills and inside of the mouth of the *Rhombus triacanthus*, or *Short-finned Harvest-fish* of this Report.

(*EXTRA-LIMITAL.*)

C. ovalis. (Say, l. c. Vol. 1, p. 394.) Body oval; eyes concealed; head attenuated and rounded before. Terminal segment rounded at tip, as long as the four preceding ones united. Length, 1·0; breadth, 0·5. Hab. mouth of *Tautoga americana* and *Labrax rufus* of this report.

C. impressa. (Id. Ib. p. 397.) Body oblong; head attenuated, terminating acutely between the bases of the antennæ. Tail widely emarginate at tip, depressed in the middle so as to appear almost bilobate, as long as the seven preceding. Length, 1·0. Hab. ———. *Cape May, N. J.*

C. lanceolata. (Id. Ib.) Body oblong-oval; head broader than long. Last caudal segment dilated, lanceolate, longitudinally carinate above, as long as the six preceding. Length, 0·7. *Cumberland island, Ga.*

C. (Æga) oculata. (Id. Ib.) Body elongate-oval. Head trilobate behind; middle lobe smallest. Abdominal segments not shorter than the terminal thoracic ones. Eyes large: facets regularly hexagonal. Last segment of the tail rounded, ciliate, shorter than the four preceding. Length, 0·5. Hab. *Sargus ovis* of this report. *Florida.*

C. immersa. (Id. Ib. p. 399.) Head subquadrate; first segment of the thorax profoundly emarginate for the head; last segment of the tail large, membranaceous towards the tip; lateral appendices very short; large joint of the fourth pair of feet extended behind into a spine. Length, 1·75. *Southern States.*

C. æstrum. (Leach, Dict. Sc. Nat. Vol 12. Desmarest, pl. 47, fig. 6, 7.) Oblong, sublinear. Carinæ of the eight last coxæ acuminate at their base. Head subquadrate, transverse; last segment of the tail subquadrate, truncate behind, broadly emarginate. According to Dr. Gould, found on the coast of Massachusetts.

GENUS LIMNORIA. *Leach.*

Body oblong-linear, convex. Head nearly as large as the first segment, with the eyes on the upper surface distant, distinct, granular. Antennæ subequal. Tail of six distinct rings. Caudal appendices composed of two lamellæ on each side of the tail. Marine.

Limnoria terebrans.

PLATE IX. FIG. 33.

Limnoria terebrans.	Leach, Lin. Trans. Lond. Vol. 11, p. 370. Sup. Encycl. Ed. Vol. 7, p. 433.
L.	*id.*	Desm. Consid. Crustacés, p. 312.
L.	*id.*	Coldstream, Ed. Phil. Jour. 1834, pl. 6, fig. 1–18.
L.	*id.*	Thompson, Ib. 1835.
L.	*id.*	Gould, Invertebrata of Mass. p. 338 and 354, cum fig.

Description. Body oblong-linear, with both extremities rounded, composed of seven segments, each bearing a pair of short feet; the following segments small, except the penultimate and the last which are broad. Female larger than the male, and recognized by the pouch in which she carries her eggs and young. Capable of rolling themselves up in a ball.

Color, ashen grey. Eyes of a blackish brown. Length, 0·15. Breadth, 0·06.

This apparently insignificant and minute animal is capable of great injury to wood exposed to salt water. It attacks in countless numbers the piers of bridges, wooden wharves, and all submerged timber, piercing it in every direction, and soon rendering it useless. It has been computed that a stick of timber exposed to these animals, where they are abundant, will lose an inch of its diameter annually. They act chiefly below low-water mark. The best mode of protection yet discovered is a coat of verdigris, or of metallic copper. The same purpose is effected by covering the whole surface with broad-headed copper nails. This animal attacks in preference pine and other soft woods, although none, except perhaps live oak, is exempted from its ravages. Its injuries are very partially counterbalanced by its benefits in destroying sunken timber, or vessels, which might obstruct channels or tideways.

GENUS ASELLUS. *Geoffroy.*

Body oblong, depressed. Head distinct. Segments transverse, crustaceous. Tail of a single segment, with two bifid appendices. Feet fourteen. Four apparent antennæ, setaceous, unequal; the two superior much shorter, four-jointed; the two lower much longer, of five joints. Several pairs of jaws. Eyes two, simple, sessile.

Asellus communis.

Asellus communis. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 427.

Description. Segments transverse, subequal, indistinctly emarginate on the lateral edges, furnished with short rigid hairs. Head narrower than the first segment, and not longer. Eyes obovate, oblique, black, prominent. Inferior antennæ equal to the peduncle of the superior ones, which latter extend to the base of the tail. Tail as broad as the segments of the body, and equal to the two preceding ones united. Appendices as long as the tail; laciniæ subequal, peduncle dilated. Anterior feet monodactyle, unarmed; thumb as long as the hand. Hand oval; carpus triangular, remaining gradually longer to the hind pair.

Length, 0.25. Breadth, 0.09.

This is a very common species in our freshwater streams, and usually found under stones and bits of wood. The female is distinguished by a valvular follicle beneath, covering the young.

(*EXTRA-LIMITAL.*)

A. lineatus. (Id. Ib. p. 428.) Body oblong, not distinctly attenuated in front. The two lower antennæ shorter than the peduncle of the upper antennæ, which latter are as long or longer than the body. Peduncle of the caudal appendices cylindrical. *Color*, pale brown, with a double dorsal brown line united at the tip of the tail, and with a brown line or two on each side of the tail. Length, 0·25. Swamps in the forests of South-Carolina. An *Janira?*

A. vulgaris? Lam. (Gould, op. cit. p. 337. Pl. 9, fig. 32 of this work.) Larger than the preceding, according to Dr. Gould. *Massachusetts.*

Genus Ligia, *Fabricius.* Body oval-oblong, with transverse segments. Two short bifid appendices at the extremity of the tail. Feet fourteen. The two outer antennæ very conspicuous, with the terminal article many-jointed; the inner antennæ not distinct. Two sessile eyes.

L. oceanica, Fab. (Desm. Consid. Pl. 6, fig. 13 of this work.) It is doubtful whether this species has been observed on our coast. Dr. Gould has noticed a species of this genus about the timbers of a decaying wharf, but which, he states, seems to be smaller than *L. oceanica.*

Genus Philoscia, *Latreille.* Body oval, with transverse crustaceous segments, narrowed towards the tail. Caudal styles four, subequal; the lateral ones biarticulate. Eyes sessile. Two outer antennæ very distinct, of eight joints, naked at their base; the inner antennæ not distinct. Terrestrial.

P. vittata. (Say, loc. cit. p. 429.) Head transversely oval; eyes longitudinally oval; antennæ with minute distant hairs; first segment of the body rather longer than the others. *Color:* Head, body and tail, with the margin and two broad vittæ, cinereous. Length, 0·2. Under stones and wood in damp places.

P. spinosa. (Id. Ib.) Body elongate-oval, armed with numerous spine-like tubercles above; sixth and seventh segments produced on each side behind, acute. Feet beneath, armed with short distant setæ. *Color*, brown. Length, 0·2. Under stones, etc. in damp places. *Savannah, Georgia.*

GENUS ONISCUS. *Linneus.*

Body oval, with transverse crustaceous subimbricated segments, susceptible of being rolled into a ball. The two outer antennæ very conspicuous, setaceous, bent, of eight joints; the inner antennæ obsolete. Two sessile eyes. Two prominent caudal appendices. Terrestrial.

Oniscus asellus.

PLATE VI. FIG. 12.

Oniscus asellus. Lin., Fab., Lat., Desm. Consid. Gen. p. 320, pl. 49, fig. 5.
O. affinis. Say, Journ. Acad. Nat. Sciences, Vol. 1, p. 430.
O. asellus. Gould, Invertebrata of Massachusetts, p. 366.

Description. Body oval, and roughened on its anterior portion. Segments of the body rounded in front on the lateral edges, and pointed behind. Tail smooth, of six segments (overlooked by the lithographer in the figure); the third, fourth and fifth with lateral prolongations; the sixth or last segment pointed with four styles, longer than the last segment. Feet fourteen, gradually increasing in size from before.

Color, dusky brown, with many irregular ashen points and marks; beneath greyish white.

Length, 0·5. Breadth, 0·3.

This is the common *Sow-bug* of cellars and gardens, and found also under stones and decaying wood. The female carries its eggs in an oval sac beneath the body, where they are hatched. The Sow-bug was formerly employed in medicine as a diuretic, but is now very properly abandoned. It feeds on decomposed vegetables, and is in no wise injurious to man. I coincide with Dr. Gould in considering the *affinis* of Say to be identical with that of Europe.

GENUS PORCELLIO. *Latreille.*

Body resembling that of the preceding genus, with the same characters, except that the outer antennæ are composed of but seven articulations.

Obs. This genus has been united by most recent writers with the preceding.

Porcellio spinicornis.

Porcellio spinicornis. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 431.

Description. Body elongate-oval, roughened with numerous granules. Third joint of the antennæ elevated above, and armed with an acute spine. Terminal joint of the tail canaliculate, hardly surpassing the first joint of the outer styles.

Color, blackish brown; cinereous on the edges. Three dorsal lines of alternate yellowish subquadrate spots. Tail with two or three small yellowish spots on each side at the base.

Length, 0·4.

This is also known under the name of *Sow-bug*, and is found in similar situations with the preceding.

(*EXTRA-LIMITAL.*)

P. nigra, Say. (*O. granulatus*, Lam.? Vol. 2, p. 354. Ed. Brux.) Very rough with elevated granules. Last caudal segment margined behind with abbreviated lines. *Color*, black, immaculate. Length, 0·3. This is found in Pennsylvania, and, according to Dr. Gould, in Massachusetts.

P. lævis? Latr. (Gould, l. c. p. 337.) Body smooth; caudal appendices larger than in the preceding. *Color*, dark ash, varied with soiled yellowish.

GENUS ARMADILLO. *Latreille.*

Habit and many of the characters of the preceding. Outer antennæ of seven joints; inner obsolete. Feet fourteen. Caudal appendices not prominent. Roll themselves up into a complete ball. Terrestrial.

Armadillo pillularis.

Armadillo pillularis. Say, Jour. Acad. Nat. Sciences, Vol. 1, p. 432.
A. *id.* Gould, Invertebrata of Mass. p. 336.
A. *pustulatus?* Desm. Consid. Gen. pl. 49, figs. 6 and 7.

Description. Body minutely punctured. Caudal segments slightly smaller than those of the body.

Color. Dull lead-color, with three lines of large yellowish spots above. Posterior margin of the segments light colored.

Length, 0·5.

This is known under the name of *Pill-bug*, from its form, in a contracted state, completely resembling a pill, and by this alone it is at once distinguished from the preceding genera. It casts its shell once a year at least, and these are frequently found under stones and boards in fields which have been their habitual resort. It appears in its markings to be closely allied to the European *A. pustulatus* of Dumeril, or *variegatus* of Lamarck; but I have had no opportunity of making a direct comparison.

It is here, at the end of this order, that we arrange the *Brongniarta trilobitoides* of Dr. Eights (*Serolis id.* of Audouin and Edwards, *Arch. Mus.* 1841, p. 29), found off the coast of Patagonia, and which appears, with the three other known species, to form a passage to the

exclusively fossil genera known under the name of *Trilobites*. It is here also that I venture to place a curious crustacean, which I find no where described. In my original notes I find it arranged under the order *Pœcilopoda*, but I prefer placing it provisionally at the end of this order.

GENUS FLUVICOLA.

Body elliptical or oval, slightly narrowed behind. Antennæ four, all concealed beneath the buckler; the outer curved and longest, of three articulations; the two posterior straight, and scarcely half the length of the others. Segments of the body trilobate. Feet three pair. Fluviatile.

Fluvicola herricki.

PLATE X FIG. 37. FIG. 38 & 39, Magnified.

(STATE COLLECTION.)

Description. Body ovate-elliptical, membranous and flexible, consisting of twelve segments vaulted in the center, and becoming thin and translucent on the edges; its whole disk margined with subequal closely approximated hairs. The head or anterior segment with faint sutures, dividing it into three pieces; near its junction with the first segment of the body is a dark colored spot, which, under the lens, presents a tubercular appearance. The two following segments are broader than the eight succeeding ones, and all, except the last, are divided by two longitudinal fissures into three series of lobes, giving to the animal a striking resemblance to trilobites. The edges of the central plates, where they touch each other, are considerably elevated; the lateral plates free, and admit of motion over each other. The whole upper surface is irregularly marked with serpentine lines and small round spots. Beneath, the mouth appears under the junction of the anterior segment with the following, resembling a short sac or tube with a transverse opening; and on each side, two dark processes, apparently the rudiments of jaws. Antennæ four; the two anterior longest, curved, not reaching the outer margin of the buckler; the two inferior straight. Immediately posterior to the mouth arise three pair of unguiculated feet, of which the posterior pair is shortest; they are furnished with scattering rigid hairs, and with a single black hook at the tip. Posterior to these feet are five pair of branchiopodal processes, resembling bunches of white tendinous filaments. Under a powerful lens, a dorsal vessel may be traced on each side, communicating with each tuft of filaments. Each tuft appears divisible into two, and these again are composed of seven or eight single filaments. *Color*, greyish brown.

Length, 0·2 – 0·3.

This singular crustaceous animal is found adhering to rocks in and near the water of West-Canada creek. It is detached with considerable difficulty, and when so detached, partially rolls itself up. It was thought a singular coincidence, that animals bearing so strong an external resemblance to trilobites should be found at the most remarkable locality in the United States for these extinct animals. It is not supposed that they properly belong to this order, to which, they are, however, allied by external form; but the form of the mouth compels us to arrange it among the Branchiopodal Crustacea, or *Crustacés suceurs* of more recent writers. I feel much indebted to Mr. I. Cozzens for another species from Rye, Westchester county.

Fluvicola tuberculata.

(STATE COLLECTION.)

Description. Body ovate-oblong, sublinear, arched along the medial line. Anterior segment rounded in front, terminating in produced points on each side behind; second and third segments larger than the following, which become successively smaller; the lateral segments oblong, quadrangular: the whole disk margined with closely beset hairs as in the preceding. On each side of the dorsal ridge, and closely contiguous to it, is a longitudinal series of abbreviated oblong elevations, which, on the three anterior segments, become more elongated, and form a depression between them instead of a ridge. Near this series, and parallel to it on each side, is a similar series of somewhat oblique tubercles, and a third series more distant, and apparently defining the boundaries of the lateral lobes. In desiccated specimens, these series of tubercles, crossing the raised edges of the segments, divide the surface into a series of quadrangular compartments. In other respects resembling the preceding. *Color*, reddish brown.

Length, 0·2–0·5.

Attached to stones in brooks at Rye, Westchester county.

ORDER VI. PŒCILOPODA.

Head confounded with the trunk; the anterior part of the body in the form of a shield. Mouth beak-shaped, or composed of appendices occupying the place of jaws. Antennæ short and simple or obsolete, usually sessile and distinct. Anterior feet terminated by one or more hooks or pincers adapted for walking or prehension; the posterior for swimming, and composed of, or attached to, branchial plates or processes.

GENUS POLYPHEMUS. *Lamarck.*

No antennæ. Shield very large, subcoriaceous, rounded in front, convex above, separated into two parts by a transverse articulation, the posterior part smallest, spinous on the sides, deeply notched behind. Tail long, trigonal, robust and pointed. Eyes two, sessile, distant, compound, semilunar. Haunches of the first six pair of feet spinous, and act as jaws. Feet twenty-two. Marine.

Obs. This genus is arranged by Lamarck under a section which he terms *Branchiopodes géants*, in allusion to the gigantic stature of some of the species. M. Edwards, however, has shown that it is not a natural group, and should not be adopted. Latreille has placed it under a family of this order, which he designates under the name of *Xyphosures*, and this has been erected into an order by M. Edwards under the same name. According to Straus-Durckheim, they are more allied in their organization to Spiders than to Crustaceans.

Polyphemus occidentalis.

PLATE XI. FIG. 50. Pincer of the male, 51.

(STATE COLLECTION.)

Limulus cyclops. Fabricius, Syst. Vol. 2, p. 488.
L. polyphemus. Latreille, Genera, Vol. 1, p. 11.
L. id. Bosc, Crust. Vol. 2, pl. 16, fig. 6. *L. albus,* Id. Shell of the young.
Polyphemus occidentalis. Lam. An. sans vert. Ed. prior, Vol. 5, p. 147; Ed. Brux. Vol. 2, p. 339.
Limulus americanus. Leach, Dict. Sc. Nat. Vol. 14, p. 537.
L. sowerbei. Id. Zool. Mis. Vol. 2, p. 72, pl. 34, young.
Arana carafecho. Parra, Descripcion, pl. 56.
Limulus polyphemus. Say, Jour. Acad. Nat. Sc. Vol. 1, p. 435.
L. id. Dekay, Annals of Lyceum Nat. Hist. Vol. 1, p. 181.

Description. Body large, particularly of the females. The anterior portion of the shield largest, rounded in front, with a narrow elevated rim; reflected beneath, and there forming

a large triangular cavity in front. It is by a separation of this rim or border, that the animal is enabled to leave its old shell. The upper surface of this anterior portion is marked by three longitudinal carinæ, more or less elevated, and separated in the adult by a deep fissure nearest the central carina, and continuous with the series of branchial openings to be noticed on the posterior portion. On the central carina, the first spinous tubercle is equidistant between the central one and the anterior rounded margin. Central tubercle often effaced. Eyes oblong-lunate, reticulated, scarcely elevated above the shield, and placed exterior to the anterior part of the lateral carina. Posterior portion of the shield produced at the sides into spinous tips, which are minutely serrate, and thickly beset with long hairs. The posterior or abdominal portion trapezoidal, deeply notched behind for the reception of the tail, where it has upturned acute spines on each side. The lateral edges, including these last, have seven ciliated serrated triangular spines; between these are six flat acute elongated slightly curved movable spines, ciliated on both edges, and gradually diminishing in length from before: the largest of these exceed an inch in length. At the junction of the two large portions of the shield is an irregularly shaped tuberculous spine with a broad basis, denticulate on its edge, ending in an acute point, and suddenly descending behind to the plane of the shell. Six apertures arranged in two longitudinal converging series; and between them, on the medial line, two minute spinous tubercles, one of which is near the anterior margin, the other just behind the line of the two posterior apertures; the under side of both portions with scattering hairs. In front of the mouth a pair of feet, with small didactylous claws, which are considered by some authors as antennæ; then follow ten feet, their haunches with a lobed projection covered with long spines over the mouth, and performing the functions of jaws: there are also distant spines on the succeeding joints. In the female, all these terminate in didactylous or multidactylous claws. In the male the anterior pair is of a different configuration (see fig. 51.): the penultimate joint ventricose, with a small tubercle at the apex; the last joint single, and shaped not unlike the toe of a bird with its claw. The last pair terminates in four movable foliaceous convex joints, which are rounded at tip, and a fifth cylindrical joint which itself ends in two movable claws. Posterior to these pairs is a large foliaceous multiarticulate structure, having at its posterior base the sexual organs. Posterior to this are ten fin-feet, united at their base in pairs, and supporting the gills on their posterior faces. Tail rigid, partially flexible in the living animal, nearly as long as the shield, triangular, rounded and smooth beneath, carinate and spinous above, ending in a sharp point.

Color, of a uniform dark brown; eyes somewhat lighter; the abandoned shells of the young white.

Total length of female, 19·0 – 22·0; of tail, 9·0 – 10·0.
Extreme width, 9·5. Height, 3·0 – 4·0.

This common species on our shores is known here under the popular name of *Horse-foot*, on account of its shape, and still retains in some districts the name given to it by the early English colonists, of *King Crab*, in allusion to its size. The males may be distinguished at

once by their inferior size. It is also sometimes called the *Sauce-pan*, in allusion to the shape of its shield, which is frequently used as a bale for boats. They come up on the shore at high water in May, when the sexes are frequently found attached. They are speared at that time in great numbers, and eaten with great avidity by hogs and poultry; but care must be taken to give them other food for some time previous to being killed, or their flesh will have a rank disagreeable taste. It is even said that this flavor will be communicated to the eggs of fowls which have fed on these animals. When, however, the flesh of this crab is carefully separated from the other parts, and boiled, it becomes a delicious savory food. They crawl slowly along the bottom, and I have never seen them swimming near the surface. When thrown upon their backs, they inflect the anterior portion of the shield upon the posterior, and likewise turn it so far back, that with the aid of their tail as a lever, they succeed, after many awkward attempts, in recovering their natural position. They are frequently caught so abundantly as to be used as a manure.

The geographical distribution of this species on our coast is not yet determined. It occurs from Massachusetts to Virginia, and probably farther south to the Gulf of Mexico, if the following, which is supposed by Mr. Say to be probably distinct, should prove to be a mere variety.

(*EXTRA-LIMITAL.*)

P. australis. (Say, Jour. Ac. Vol. 1, p. 436.) Disk five-spined; three in a longitudinal line, and a smaller one on each side in a transverse line with the anterior spine, and nearer to the elevated lateral angles. *Carolina and Florida.*

Genus Argulus, *Muller.* Body oblong, covered by a rounded oval membranous shield, somewhat flattened, emarginated behind. Feet twelve, of three kinds: the two anterior tubular, subhemispherical, adapted for prehension; those of the second pair biunguiculate; the remainder natatory, having at their tips two lobes ciliated on their edges. Antennæ four, very minute. Two distant eyes. Mouth externally a sucker of a conical shape, directed downwards. Parasitic.

A. catostomi. (Dana & Herrick, Am. Jour. Sc. Vol. 31, p. 297.) Shell nearly circular, transparent, slightly convex. Eyes compound. Antennæ before the eyes; posterior pair with four joints, one-third longer than the anterior pair, which has but two. *Color*, light sea-green. Attached to the inside of the gill-cover of a species of *Catostomus*. *Connecticut.*

A. alosæ. (Gould, Invert. Mass. p, 340 and figure. See Pl. 10, fig. 45 of this book.) Shield obcordate, covering only the first two pairs of legs. Abdomen narrow and half as long as the shield, bearing the next three pairs; these, as well as the preceding, have long fringed tips. Inferior caudal plates two, and covered by two others which are long and broad. Length, 0·5. Gills of the Alewife, *A. vulgaris*. *Massachusetts*

Genus Caligus, *Muller.* Body elongated, depressed, and apparently divided into two parts: the anterior covered by a shield in a single piece; the posterior oval or oblong, often with terminal lamellar appendages, and in the female with two long filiform appendages. Feet ten to fourteen, of two kinds: the anterior pairs unguiculate; the posterior lamellar, natatory and pectinated. Antennæ two, very small, setaceous. Eyes two, distant, and placed under the anterior rim of the shield. Mouth forming a sucker externally as in the preceding, bent downwards, pectoral. Parasitic.

C. americanus. (Pickering & Dana, Am. Jour. Sc. Vol. 34, pl. 3, 4 and 5. Pl. 10, fig. 46 (male) and fig. 47 (female) of this work.) Oval-oblong. Length, 0·5 – 0·6. Found attached to the outer surface of the *M. americana*, or common Cod-fish of our coast.

C. piscinus. Latreille. (Say, Ac. Sc. Vol. 1, p. 437. Gould, l. c. p. 340.) Disk small and rounded, with two flattened jointed appendages behind, sometimes an inch long. Occurs on the cod and other marine fishes. Length, 0·2. *Northern Coast.*

C. cristatus. (Gould, l. c. p. 340.) Two little elevated crests within each posterior angle of the shield, at right angles to each other. Abdominal and caudal plates very long and broad. Margin of shield behind the antennæ, thin, and minutely fringed. Total length, with the caudal appendages, 1·5. Dr. Gould suggests that it may prove to be *Pterygopoda latreilli.* Attached to *Lamna punctata.*

GENUS ANTHOSOMA. *Leach.*

Shield suborbicular. Antennæ two, six-jointed. Feet twelve. Abdomen much narrower than the shield, with two foliaceous plates on the back, and six others beneath; first pair of feet unguiculated, the tip opposed to a small tooth on the preceding joint; second pair with a compressed nail; third pair with its last joint very thick, dentate in front. Beak a siphon. Two long caudal filaments. Parasitic.

Anthosoma smithii.

Anthosoma smithii. Leach, Dict. Sc. Naturelles, Vol. 14, p. 533.
A. id Griffith's Cuvier's Règne Animal, Vol. 13, p. 374, pl. 21, fig. 3.

Description. Whitish tinged with reddish; the filaments of the tail slender, cylindrical, much elongated: the three posterior pairs form a case enveloping the post-abdomen.

Length, 1·0.

This small crustacean appears to be a parasite peculiar to the Shark family. It was first noticed by Leach on the *Lamna cornubica;* then by Risso (*Ichthyol.* p. 38), on the *Squalus ferox* (*Scyllium*); and subsequently by Storer, on the *Lamna punctata* of our coast.

(*EXTRA-LIMITAL.*)

Genus Pandarus, *Leach.* Body ovate, occasionally elongate, ending in two long filaments. Shield rounded in front, truncate behind. Antennæ two. Feet fourteen; the six anterior unguiculated, the others bifid. Body covered with transverse scales, dentate on their posterior edges. Parasitic.

P. sinuatus. (Say, l. c. p. 436.) Body oblong, quadrate, dilated. Scales six: four subequal, in a transverse line at the base of the abdomen, rounded at tip; two larger, arising beneath the preceding, slightly dentate at the tip, and not concealing half the abdomen, which is sinuate behind. Length, 0·2. Hab. body of *Mustelus canis*, or *American Hound-fish.*

Genus Cecrops, *Leach.* Body oval, obtuse at the extremities, covered with four unequal scales which are emarginate. No posterior filament. Feet fourteen: the six anterior unguiculate; fourth or fifth bifid; sixth and seventh with dilated coxæ; the others membranous, dilated, natatory. Antennæ two, very small. Parasitic.

C. latreilli, Leach. (Desm. pl. 50, fig. 2. Storer, Rep. Fishes, p. 172. Pl. 10, fig. 44 of this work.) Shield coriaceous, bipartite: the anterior portion obcordate, deeply emarginate behind; the posterior consists of three, overlapping each other, and becoming gradually larger from before. Antennæ of two joints, terminated by a single hair. Hab. *Orthagoriscus mola. Northern Coast.*

GENUS LERNEA. *Cuvier.*

Body long, cylindrical, more or less filiform; enveloping membrane sub-coriaceous. Head enlarged, with processes varying in number and size. Caudal extremities variously terminated. Parasitic.

Obs. The animals of this and the following genus were originally arranged under the *Intestinal worms.* They have, however, notwithstanding their anomalous vermiform appearance, too many characters in common with the crustaceans, to leave them where they were originally placed. Some late writers have proposed to erect them into a distinct class between Insects and Worms.

Lernea cruciata.

Lerneocera cruciata. Lesueur, Ac. Nat. Sciences, Vol. 3, p. 286, pl. 11, fig. 4.

Description. Body slender before, dilated behind, transparent; mouth central, surrounded by five robust processes. On the caudal extremity are five rounded tubercular processes.

Found attached to the *Cichla ænea*, or *Rock Bass* of Lake Erie.

Lernea radiata.

Leech. Latrobe, Trans. Am. Phil. Soc. Vol. 5, p. 80, pl. 1.
Lerneocera radiata. Lesueur, Jour. Acad. Nat. Sciences, Vol. 3, p. 288, pl. 11, fig. 1.

Description. Body filiform in front; somewhat enlarged behind. Head with five flexible processes. Caudal extremity with a short central lobe, and a long filiform process behind on each side. Found on the *Alewife*.

GENUS PENELLA. *Oken.*

Head enlarged, and furnished at the nape with two small horns; the neck corneous. Body long, wrinkled transversely, and furnished behind with small filaments disposed like the barbs of feathers. Two very long filaments originate at the commencement of this pinnated portion.

Penella plumosa.

Description. Body susceptible of great contraction and dilatation. Head enlarged, with numerous foramina at its extremity. The rudiment of a third elongated process on the nape. Caudal extremity with a series of processes on each side, eighteen to twenty in number, which, under the lens, appear bulbous.

Color. All the free portion of a dark red or purple.

Length, 2·0 -- 3·0.

Found on the bodies of *Rhombus ferrugineus* and *Diodon plumosus* of this report.

(*EXTRA-LIMITAL.*)

P. filosa. (Cuv. Griff. Vol. 12, p. 466. Ellis, Tr. Phil. Vol. 63, p. 15, 20. Gould, op. cit. p. 341.) Seven or eight inches long. Found attached and deeply buried in the body of the *Orthagoriscus mola*.

ORDER VII. PHYLLOPODA.

Shield delicate, of a single piece, free behind. Two corneous mandibles, semicylindrical, without palpi; the tip compressed, straight and dentate. First pair of feet oar-shaped, and terminating in articulated setæ; the others branchial, and composed of more than sixty pairs.

(*EXTRA-LIMITAL.*)

Genus Apus, *Scopoli.* Head confounded with the shield, which is soft, subcrustaceous, rounded, oval, emarginate behind. Tail short, jointed, ending in two long threads. Antennæ two, short, simple. Three sessile, unequal eyes.

A. caudatus. (*Binoculus id.* Say, l. c. Vol. 1, p. 437.) Body subovate. Antennæ more than half as long as the body. Tail of three segments, half as long as the body; second segment transversely quadrate, narrower than the first in the female, elongated and attenuated in the male. Length, 0·01. *Florida.*

Obs. I place this species here with some hesitation. It is probable also that near this will be placed that singular crustaceous fossil described in the *Annals of the Lyceum of Natural History of New-York*, Vol. 1, p. 375, pl. 29, under the name of *Eurypterus remipes.* Milne-Edwards appears disposed to think that it forms a passage between the *Isopoda* and *Branchiopoda.*

ORDER VIII. LOPHYROPA.

Head confounded with the anterior portion of the body. Eye or eyes sessile and compound. Shield variable in form and size. Mandibles without palpi. No branchiæ near the mouth. Feet variable in number, natatory, sometimes simple or branched, occasionally lamellar and furnished with hairs.

(*EXTRA-LIMITAL.*)

Genus Cyclops, *Muller.* Body elongated, narrowed behind, divided into transverse segments, of which the first is largest. Tail ending in two setaceous points. Antennæ two to four, simple. A single eye on the back of the first segment. Feet six to twelve, hairy.

C. navicularis. (Say, op. cit. Vol. 1, p. 441.) Body oval, truncate behind. Tail as long as the thorax; terminal joint bifid, with four setæ, and two small equal spines at the base of each pair of seta. Anterior antennæ two-thirds the length of the body. *Color*, sanguineous; tail and feet white. Stagnant fresh water. *Southern States.*

Obs. Closely allied to this is a minute crustacean, found abundantly in deep water in Lake Ontario. I am indebted to my friend Dr. Charles Pickering for the following notes on this animal.

Genus Scopiphora, *Pickering.* Body small. Eye single, near the anterior margin of the shield. Antennæ large, and as long as in the preceding genus, and has the same motions in the water. Abdomen terminating in two styles, each with three setæ; a brush under the last or last three joints. Ovaries none. Legs spiny.

S. vagans. (Pickering, MSS.)

ORDER IX. BRANCHIOPODA.

Body often minute, with a subcrustaceous covering. Two pedunculated eyes. Feet solely adapted for swimming, and supporting the branchial apparatus.

GENUS BRANCHIPUS. *Latreille.*

Body elongated, soft, transparent, divided into eleven segments. Tail of six to nine segments, long, subcylindrical, gradually diminishing and terminating in two ciliated fins. Feet lamellar, of twelve pairs. Antennæ two or four, setaceous. Two compound pedunculated eyes. Two movable horns on the front, forked at the tips. Mouth presenting a beak-shaped papilla, and four small lateral pieces. Stagnant pools of fresh water.

BRANCHIPUS STAGNALIS.

PLATE IX. FIG. 36.

Cancer stagnalis, LIN. *Gammarus id.* FAB. Syst. Vol. 2, p. 518.
Branchipus stagnalis. DESM. Considerations, &c. p. 389, pl. 56, figs. 2 – 5.
Branchipus stagnalis. GOULD, Invertebrata of Mass. p. 339.

Description. Horns of the male horizontal; terminal caudal fins broad. Antennæ four. Length one inch.

According to Dr. Gould, this species is common in most of our stagnant pools. I have not studied it carefully, and have introduced a foreign figure to illustrate the species.

ORDER X. OSTRAPODA.

Body small, enclosed between two lateral valves. No distinct head. A single compound sessile eye. Feet formed for walking. Mandibles bearing palpi. Antennæ long, setaceous, and terminated by a fasciculus of hairs.

GENUS CYPRIS. *Muller. Straus.*

Shield opening and closing like the valves of a bivalve mollusk. Tail soft, reflected on itself, and with two filaments at its extremity. Feet three pair. Eye large and spherical.

Obs. This genus appears to be very numerous, upwards of twenty species having been more or less well characterized. It has also been noticed in a fossil state.

Cypris hispida.

PLATE X. FIG. 48, 49 (Magnified).

(STATE COLLECTION.)

Description. Valves, when viewed together, resemble a minute *Modiola*. Epidermis uniform jet black, and covered with numerous whitish rigid hairs.

Length, 0·09 – 0·1.

I have never had an opportunity of examining this species alive. It appears to be allied to the *Monoculus puber* of Jurine (*Hist. des Monocles*, p. 171), in its hirsute appearance; but it has neither the color, nor the two parallel oblique bands attributed to that species. My specimens were obligingly communicated by Dr. Budd, from the neighborhood of Lake Champlain. I have seen others from Hoboken, New-Jersey.

(*EXTRA-LIMITAL.*)

C. agilis. (Haldeman, Proc. Acad. Nat. Sc. 1841.) Height rather more than half the length. Base subrectilinear. *Color*, light ochraceous. Ditches. *Lancaster county, Pennsylvania.*

C. simplex. (Id. Ib.) Elongated, nearly straight; both ends alike. The same locality with the preceding.

Genus Cytherina, *Lamarck.* Form of the preceding; antennæ two, hairy throughout their length; head concealed. Feet eight, chiefly marine.

C. bifasciata. (Say, l. c. p. 439.) Valves clothed with minute dense hairs. Antennæ as long as the valves. *Color*, greenish testaceous tipped with black; two black bands; feet white. Length, 0·05. Pools of fresh water. *Georgia and Florida.*

Genus Daphnia, *Muller.* Shield subunivalve, opening longitudinally on one side. Two branched antennæ, or anterior feet, arising from the sides of the neck. Eight to twelve feet. Fresh-water pools.

D. angulata. (Say, l. c. p. 440.) Sides striate with numerous parallel minute oblique lines; hind edge of the body with a prominent angle in the middle. Antennæ with four filaments on the upper and five on the lower branch. *Color*, white or red. Length, 0·1. Stagnant water in the forests of the Southern States.

D. rotundata. (Id. l. c.) Body rounded behind. Upper antennæ three-branched: a small spine above at the joints; lower, five-branched. *Color*, white. Length, 0·05. Same locality with the preceding.

LIST

OF

PLATES OF THE CRUSTACEA.

PLATE 1.

Fig.

1 Platyonichus ocellatus.

PLATE 2.

2 Platycarcinus irroratus.

PLATE 3.

3 Lupa dicantha.

PLATE 4.

4 Libinia canaliculata.

PLATE 5.

5 Carcinus mœnas.
6 — —
7 Platyonichus ocellatus.

PLATE 6.

8 Lupa pelagica.
9 Gelasimus vocans.
10 — —
11 Lithodes arctica.
12 Oniscus asellus.
13 Ligia oceanica.
14 Cyamus ceti.

PLATE 7.

Fig.

14 Hyas coarctata.
15 Pilumnus harrisi.
16 Pinnotheres ostreum.
17 Hippa talpoida.
18 Pandalus annuliformis.
19 Orchestia gryllus.
20 Mysis spinulosus.

PLATE 8.

21 Pagurus pollicaris.
22 — longicarpus.
23 Gonodactylus setimanus.
24 Crangon septemspinosus.
25 Astacus bartoni.

PLATE 9.

26 Panopeus herbsti.
27 Talitrus quadrifidus.
28 Orchestia longicornis.
29 Gammarus minus.
30 Palemon vulgaris.
31 Hypolite aculeatus.
32 Asellus vulgaris.
33 Limnoria terebrans.

Fig.

34 Anthura gracilis.
35 Idotea tricuspis.
36 Branchipus stagnalis.

PLATE 10.

37 Fluvicola herricki.
38 (Underside magnified.)
39 (Upperside ditto)
40 Cymothoa triloba.
41 — olivacea.
42 Stenosoma irrorata.
43 Cerapus tubularis.
44 Cecrops latreillii.
45 Argulus alosæ.
46 Caligus americanus(male)
47 — — female.
48 Cypris hispida.
49 (Valves of the same.)

PLATE 11.

50 Polyphemus occidentalis.

PLATE 12.

51 Homarus americanus.
52 (Lateral view of the beak.)

INDEX.

PAGE.

Alpheus heterochelis, ---- 26
— minus, ---------- 26
AMPHIPODA,--------- 35
Amphithoe serrata, ------ 38
— punctata, ----- 38
— dentata,------- 38
Anthosoma smithii, ------ 58
Anthura gracilis,-------- 44
Apus caudatus, ---------- 61
Argulus catostomi, ------ 57
— alosæ, ---------- 57
Armadillo pillularis, ----- 52
Asellus communis,------- 49
— lineatus,---------- 50
— vulgaris, -------- 50
Astacus affinis,---------- 23
— bartoni,--------- 22
— blandingii, ------ 23
— oreganus, ------- 23
BRANCHIOPODA,---- 63
Branchipus stagnalis, ---- 63
Caligus americanus, ----- 58
— cristatus, -------- 58
— piscinus, -------- 58
Callianassa major,------- 22
Caprella equilibra,------- 41
— geometrica,----- 41
— sanguinea,------ 41

PAGE

Carcinus mœnas,--------- 8
Cecrops latreilli, -------- 59
Cerapus tubularis,------- 38
Crangon boreas, --------- 26
— septemspinosus,-- 25
Cyamus abbreviatus, ----- 40
— ceti, ---------- 40
Cyclops navicularis, ----- 62
Cymothoa immersa,------ 48
— impressa,------ 48
— lanceolata,----- 48
— oculata,------- 48
— œstrum,------- 48
— olivacea, ------ 47
— ovalis,--------- 48
— prægustator,--- 47
— triloba, ------- 46
Cypris agilis,---------- 65
— hispida, --------- 64
— simplex,-------- 65
Cytherina bifasciata, ----- 65
Daphnia angulata,------- 65
— rotundata, ------ 65
DECAPODA,--------- 1
Diastylis arenarius, ------ 32
Fluvicola herricki, ------ 53
— tuberculata,---- 54
Gammarus appendiculatus, 37

PAGE.

Gammarus locusta, ------ 37
— fasciatus,----- 37
— minus, ------ 37
— mucronatus,--- 37
Gebia affinis,---------- 22
Gelasimus vocans,------- 14
Gonodactylus sctimanus,-- 34
Hepatus fasciatus, ------- 17
Hippa talpoida, --------- 18
Hippolyte aculeatus, ----- 27
— sowerbyi, ----- 27
Homarus americanus, ---- 23
Hyas coarctata, --------- 3
Hyperia latreilli, -------- 39
Idotea cæca,------------ 42
— triloba, ---------- 43
— tricuspis,--------- 42
Ilia punctata, ---------- 17
ISOPODA,---------- 42
Lepidactylis dytiscus, ---- 38
Leptopodia calcarata,----- 3
Lernea cruciata,--------- 59
— radiata, --------- 60
Libinia canaliculata, ----- 2
Ligia oceanica, --------- 50
Limnoria terebrans,------ 48
Lithodes arctica, -------- 17
LŒMIPODA,--- ----- 40

	Page.
LOPHYROPA,	62
Lupa dicantha,	10
— maculata,	11
— pelagica,	11
Mithrax hispidus,	4
Monolepis inermis,	21
— spinitarsus,	21
Mulcion lesueuri,	30
Mysis spinulosus,	31
Næsa caudata,	45
— depressa,	45
— ovalis,	45
Nautilograpsus minutus,	15
Ocypoda arenarius,	13
Oniscus asellus,	51
Orchestia gryllus,	36
— longicornis,	35
OSTRAPODA,	64
Pagurus bernhardus,	20
— longicarpus,	20
— pollicaris,	19
— vittatus,	20
Palemon tenuicornis,	30
— vulgaris,	29
Pandalus annulicornis,	28
Pandarus sinuatus,	59
Panopeus herbsti,	5
— limosus,	5
Penella filosa,	60
— plumosa,	60
Peneus setiferus,	30
Philoscia spinosa,	50
— vittata,	50
PHYLLOPODA,	61
Pilumnus harrisi,	7
— aculeatus,	8
Pinnotheres byssomiæ,	13
— cylindricum,	13
— maculatum,	13
— monodactylum,	13
— ostreum,	12
Plagusia sayi,	16
Platycarcinus irroratus,	6
— sayi,	7
Platyonichus ocellatus,	9
Podocerus cylindricus,	39
PŒCILOPODA,	55
Polyphemus occidentalis,	55
— australis,	57
Porcellio lævis,	52
— nigra,	52
— spinicornis,	51
Porcellana galathina,	21
— pilosa,	21
— sociata,	21
Sesarma cinerea,	15
Scopiphora vagans,	62
Sphæroma quadridentata,	44
Squilla empusa,	32
Stenosoma filiformis,	44
— irrorata,	43
STOMAPODA,	31
Talitrus quadrifidus,	36
Unciola irrorata,	38
Xantho mercenaria,	4

CORRECTION.

In Mollusca, page 124, line 17, for "*penesma* et *disseminato*," read "*penes me*, and *Disseminator*."

PLATES

OF THE

MOLLUSCA.

Plate I

Fig 1

Nat size

Fig 2

Nat size

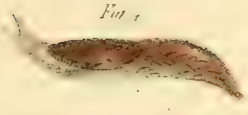


Fig 4

Nat size

Fig 5

Nat size

Fig 3

Nat size

J.W. Hill.

Lith of Endicott New York.

Plate 2

J.W. Hill.

Lith. of Endicott New York.

Plate 3.

Nat size
Nat size
Nat size

Mag 6 times
Mag 7 times
Mag 5 times
Mag 8 times
Mag 3 times
Mag 5 times
J.M.Hall
Lith.et Endicott.N.York

PLATE 5.

J.W. Hill

Lith. of Endicott, N.Y.

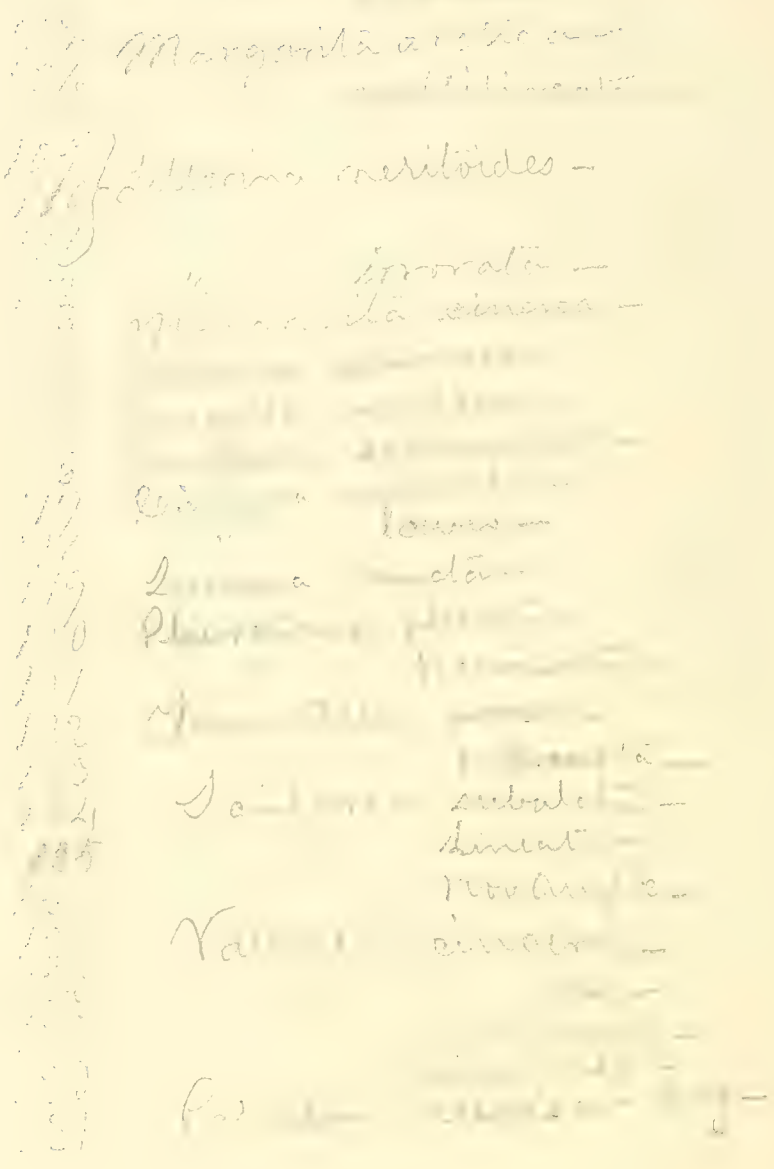


PLATE 6.

Lith of Endicott New York

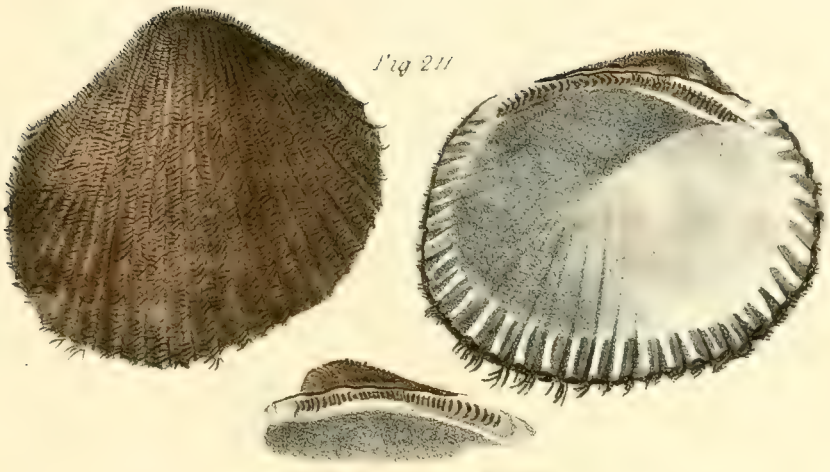
J. W. Hill

Ph. of Endicott N. York

204.
200
201
198
202
Head
197
199
203
Lith of Endicott New York

Fig 205

Lith of Endicott New York



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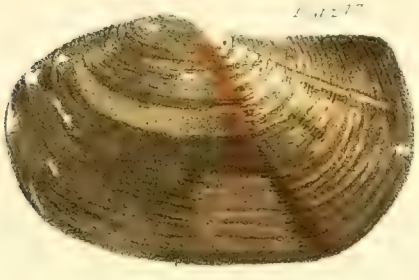

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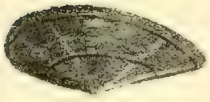

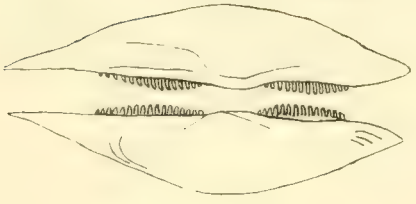

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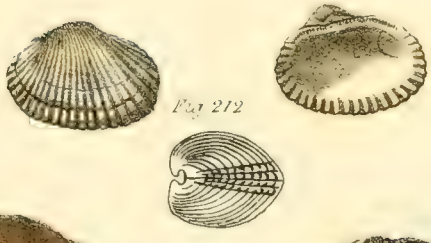

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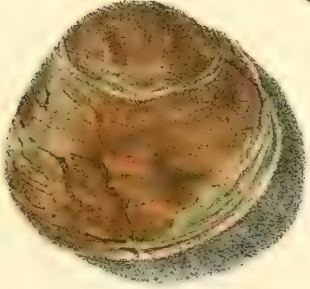
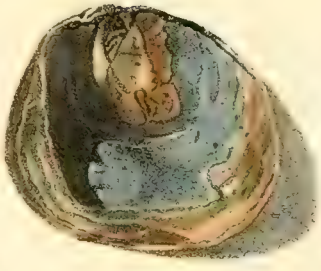




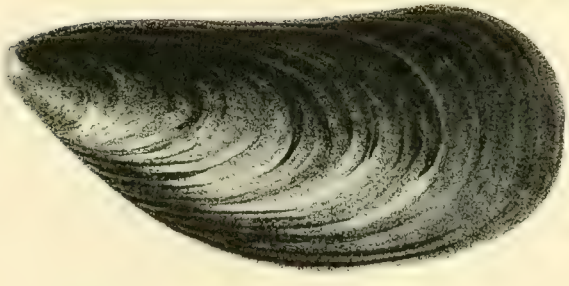
a

b

Fig 218

Fig 220

Fig 219



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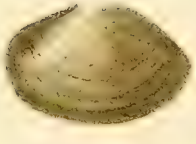

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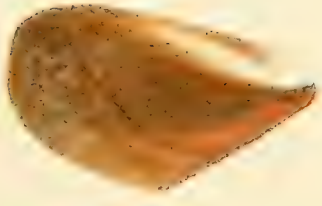


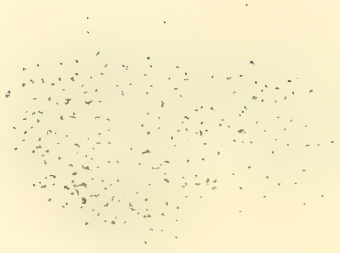
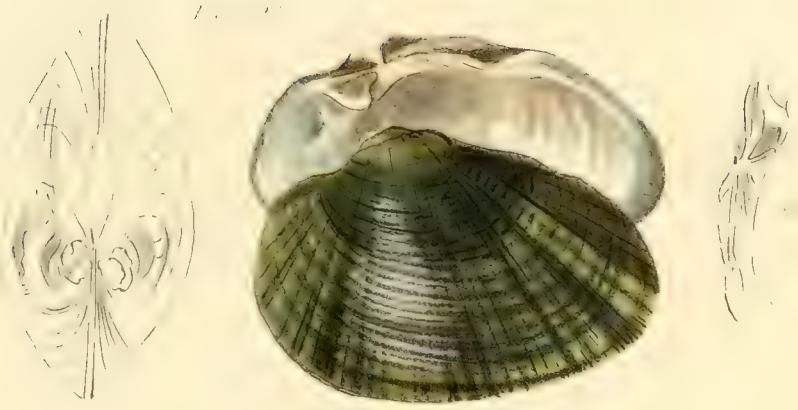
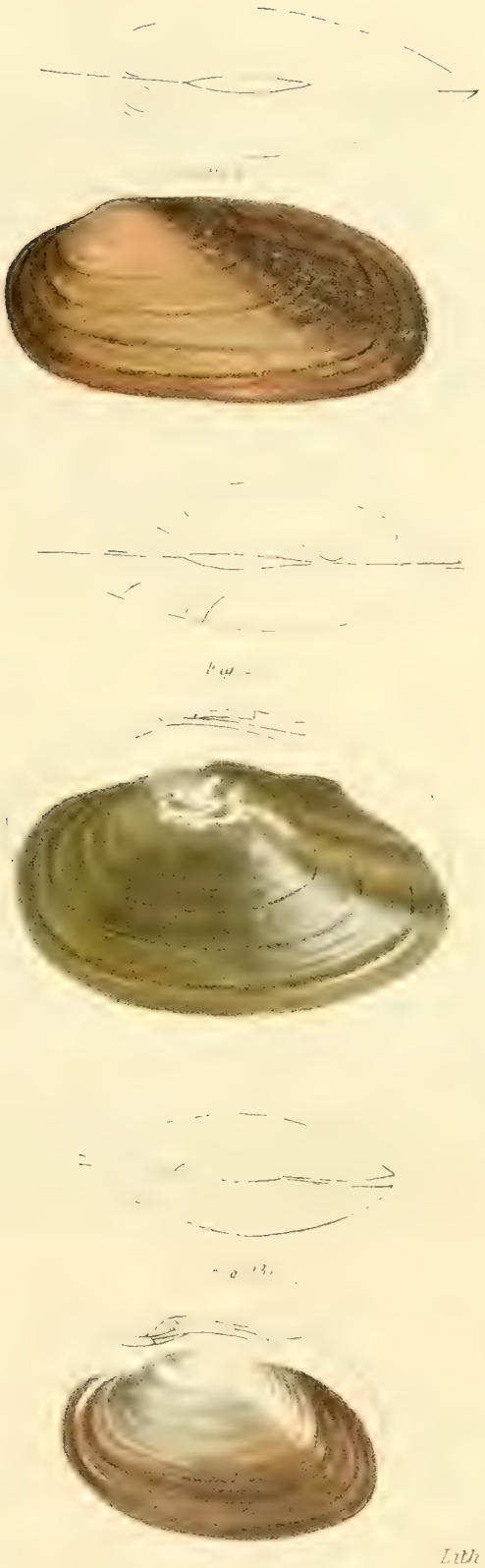


Fig 225

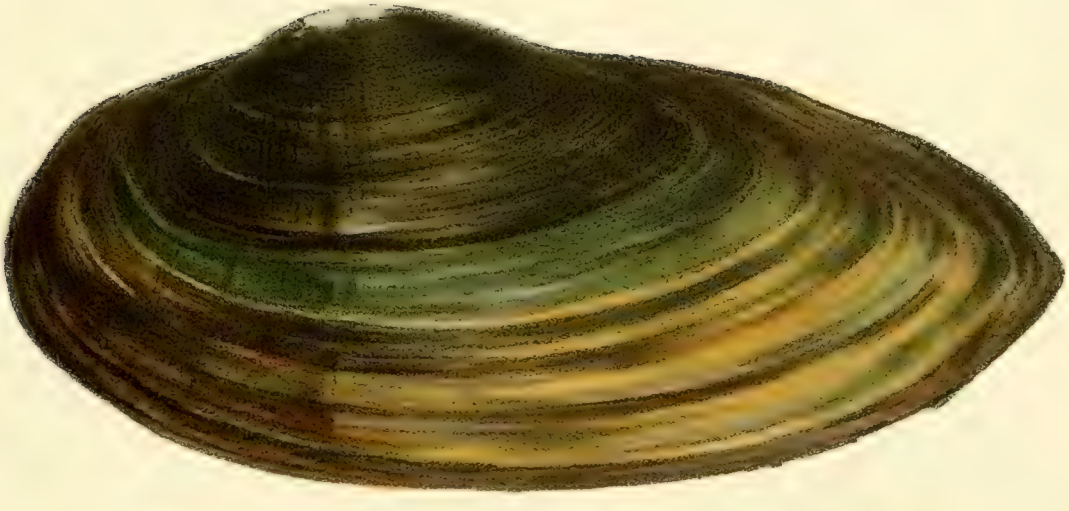
Fig 226





Lith of Endicott

Fig 23.?



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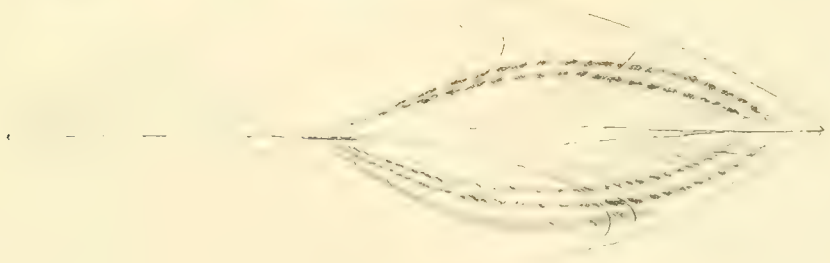


Fig 233

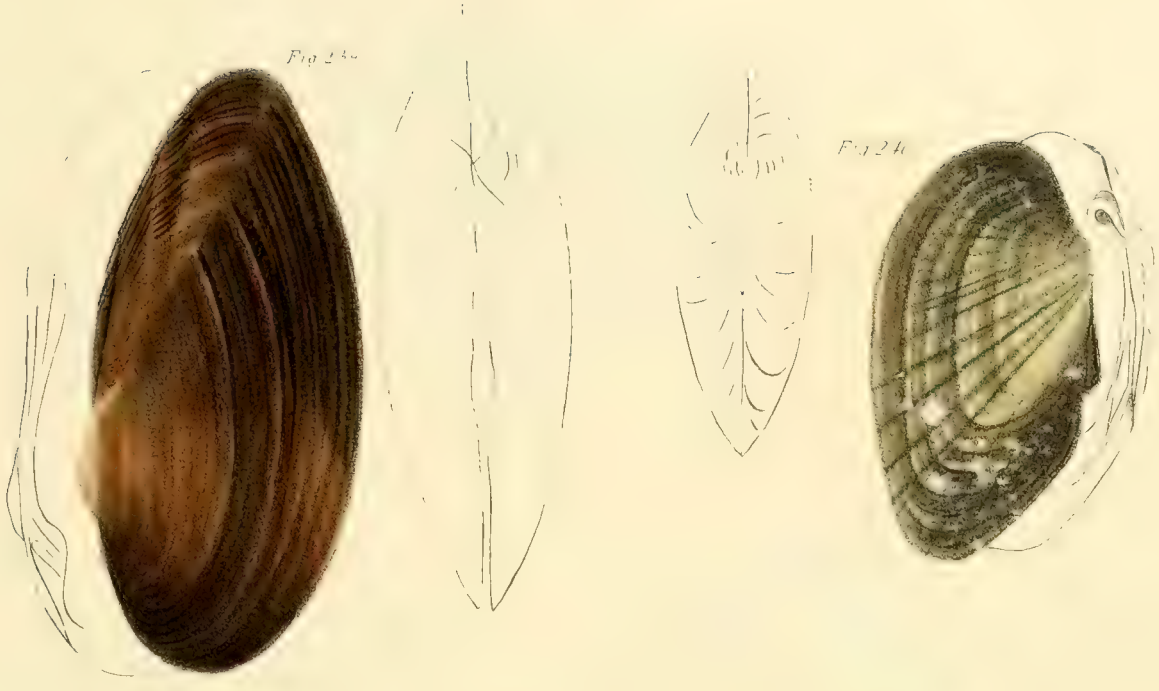
Fig 236

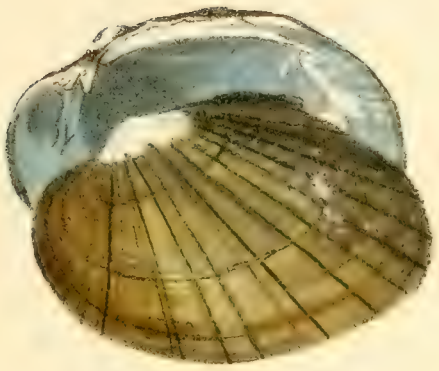
Fig 234

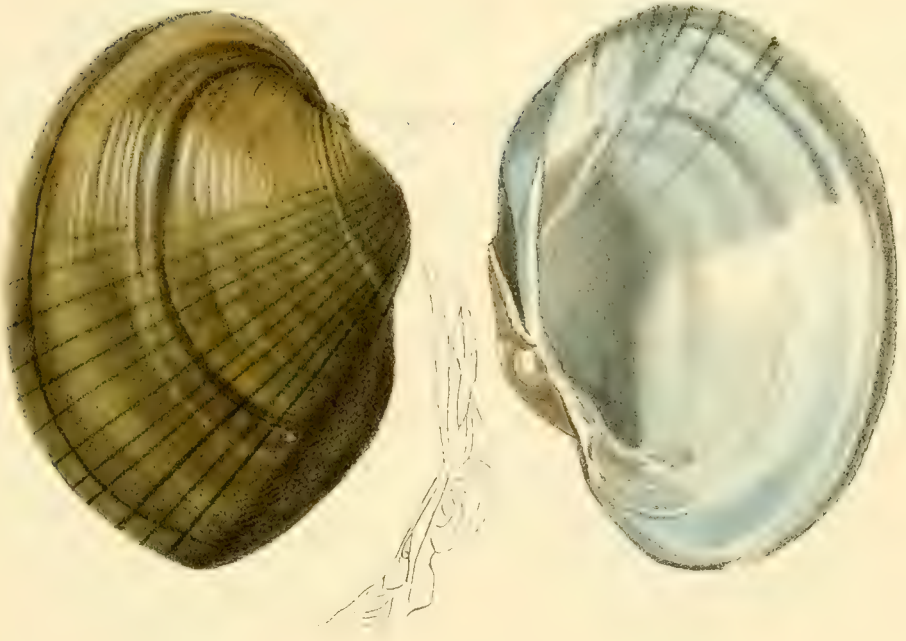
Lith of Endicott New York

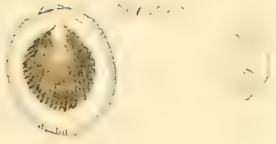
Fig 234

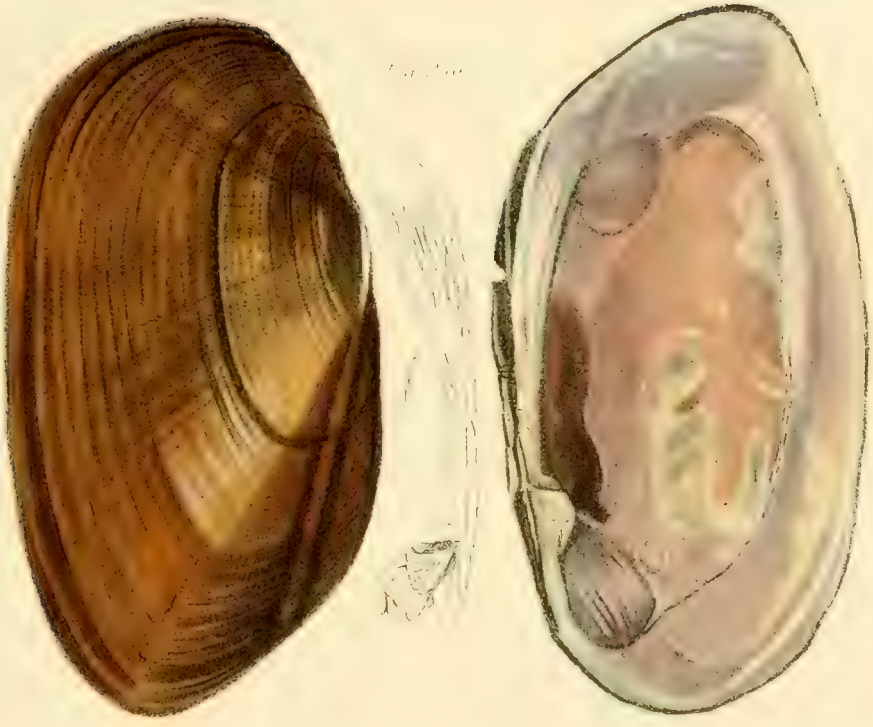
Fig 235











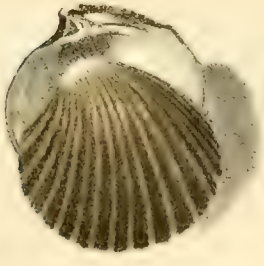
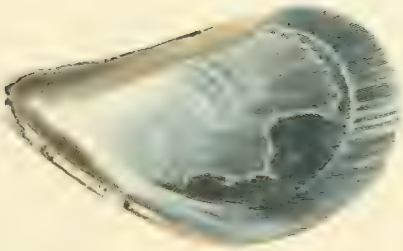


Fig 25.

Fig 25b

Fig 25d

Lith. of Endicott New York



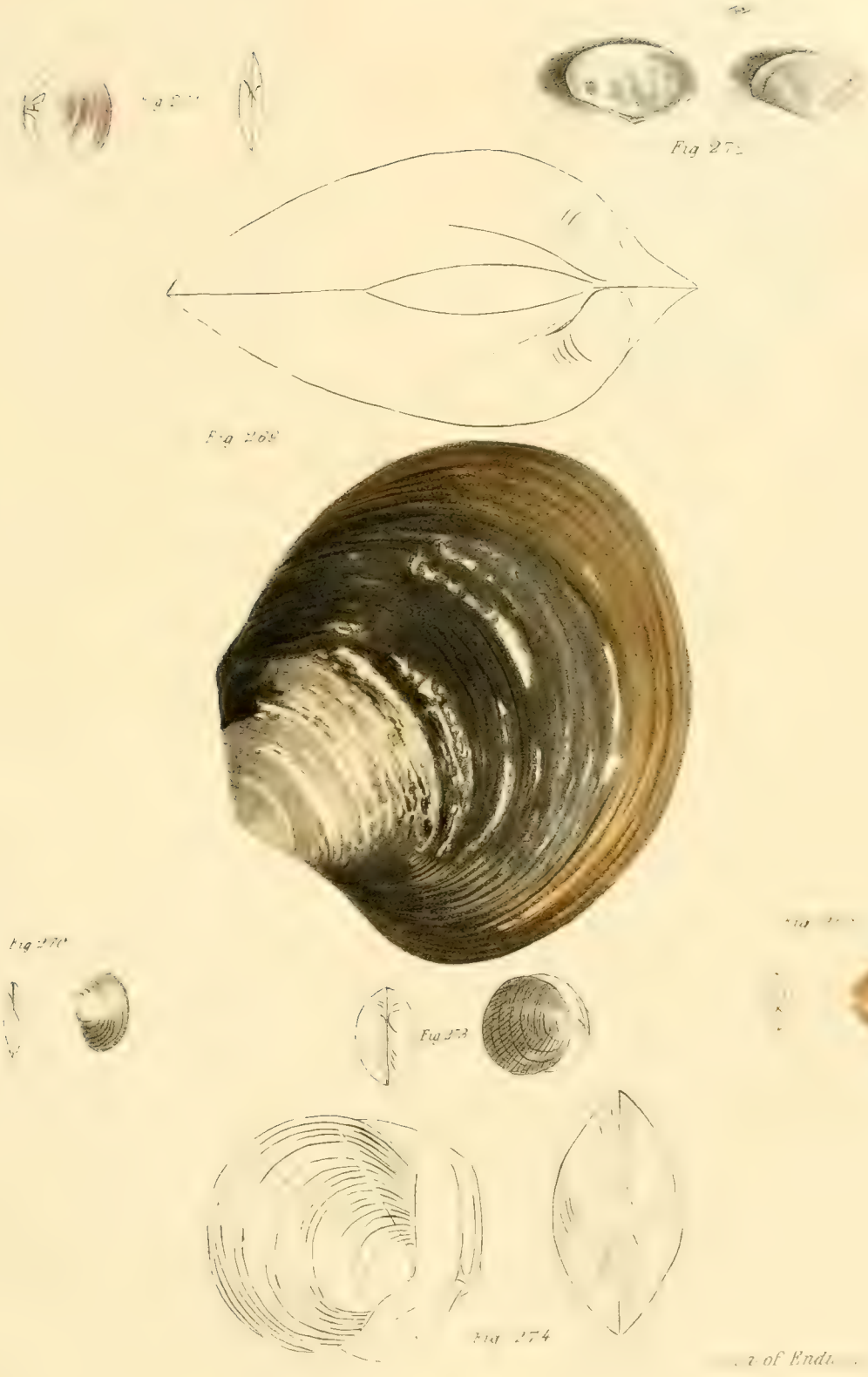


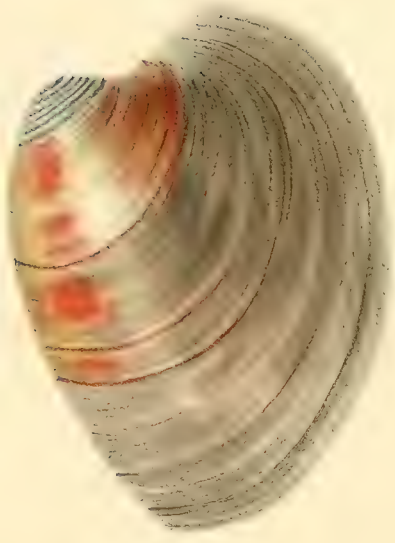
Fig 272

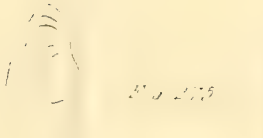
Fig 269

Fig 270

Fig 273

Fig 274





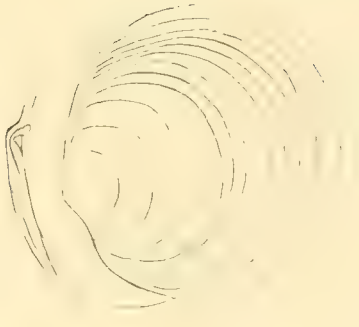


Fig 278

Fig 279

Lith of Endicott

PLATE 28.

Fig 284

Fig 283

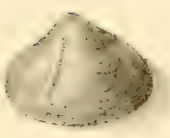
PLATE 29

Fig. 288

Fig 286

Fig 289

287



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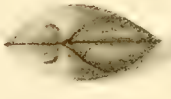
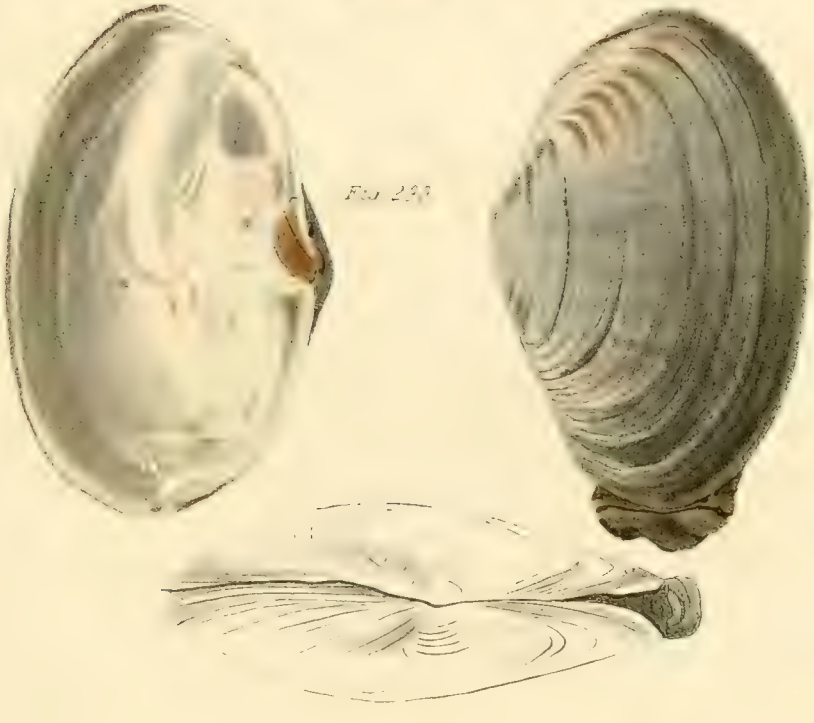


Lith. of Endicott New York



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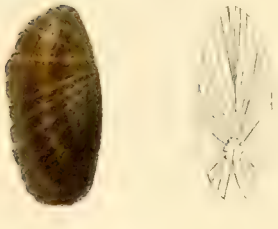


293

296 297

294 295

Fig. 298

299

300 b

301 a

301 b

Lith of Endicott

Lith. of Endicott.

Fig 309 a.

Fig 312

Fig 309 b

Fig 313.

Fig 308

Fig 311 a

Fig 311 b

Fig 310

Fig 310 a

Fig 310 b

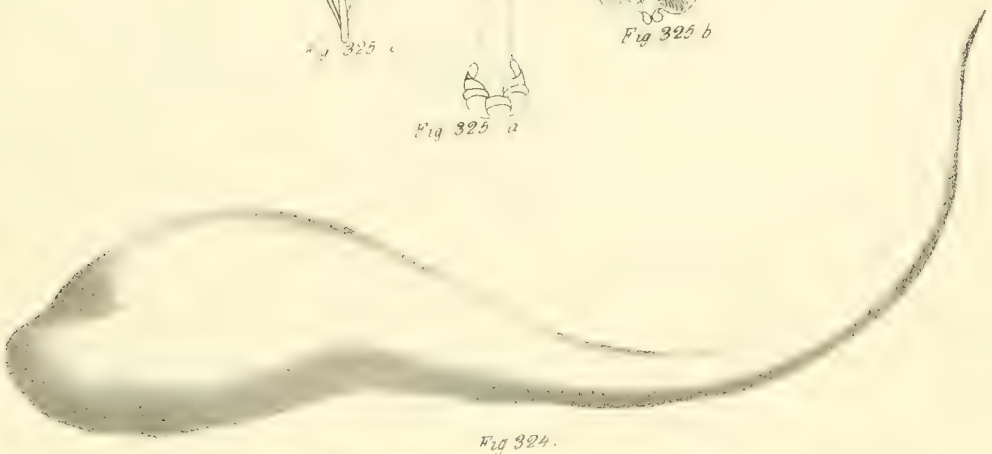
Lith. of Endicott New York

Fig 317

Fig 325 c

Fig 325 b

Fig 325 a



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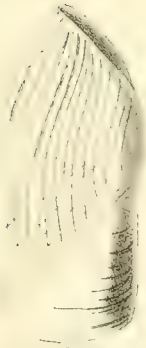


Fig 322 a

Fig 318

Fig 323 b

Fig 321

Maa

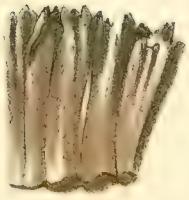


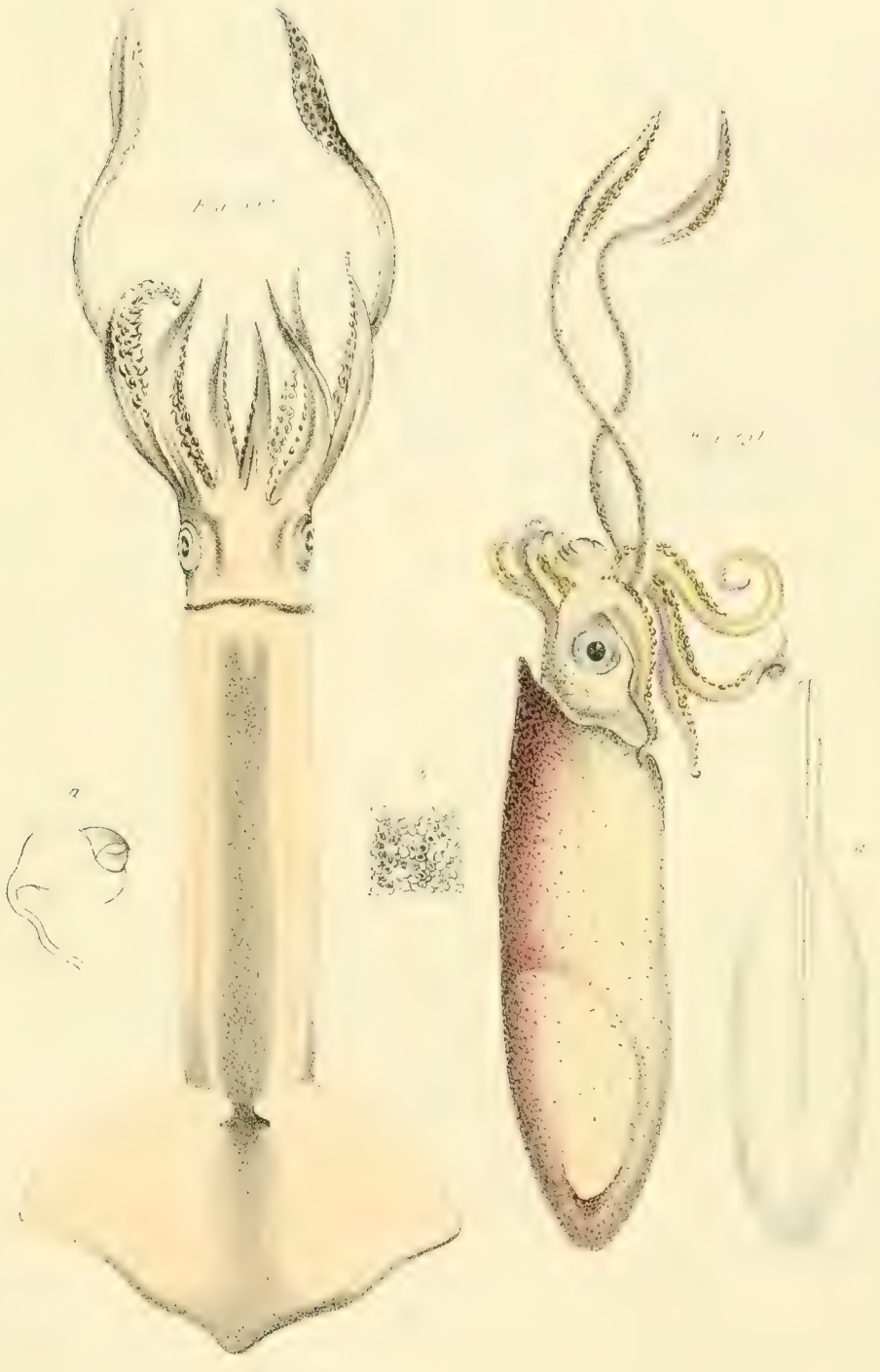
Fig 319

Fig 315

Fig 320

Lith. of Endicott

Fig. 330



Lith. of E. Ward

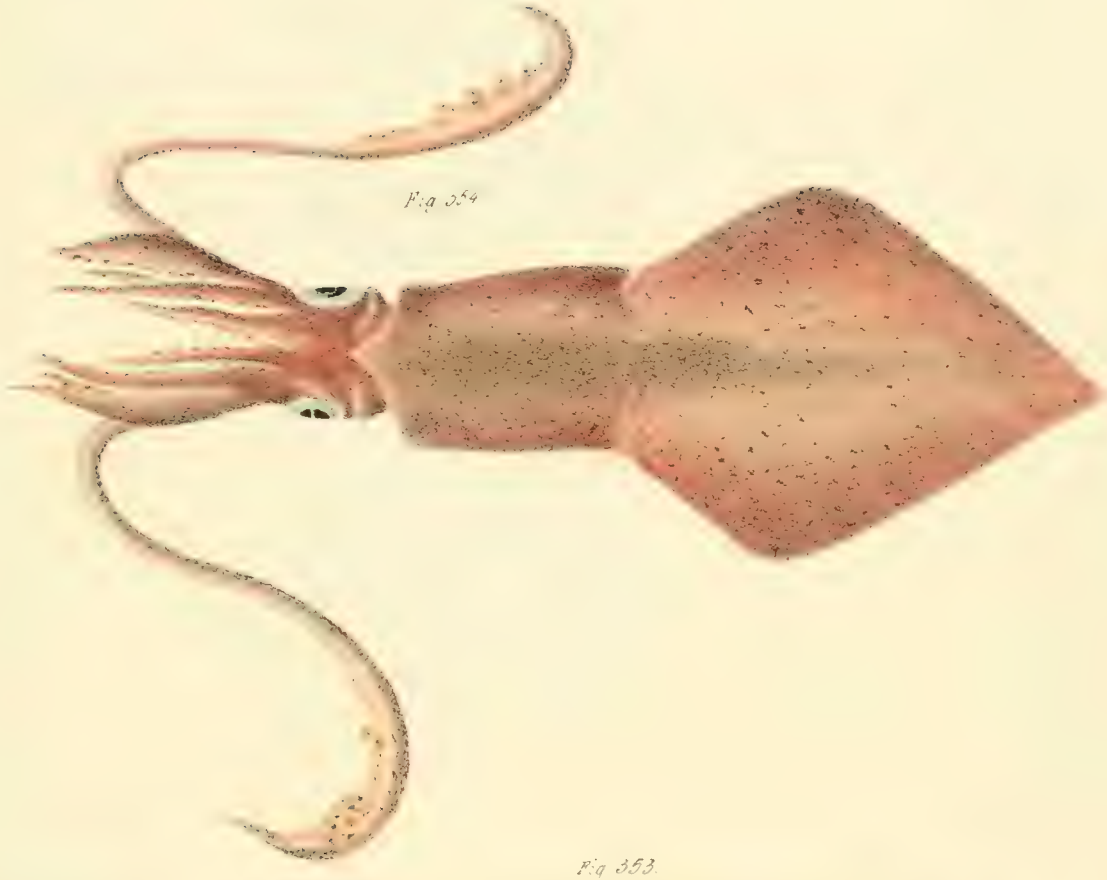
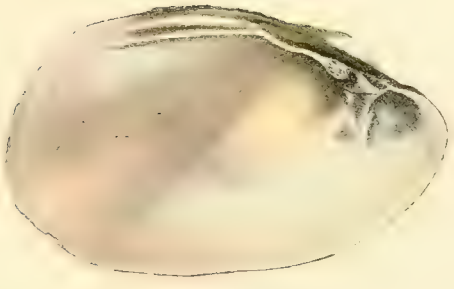
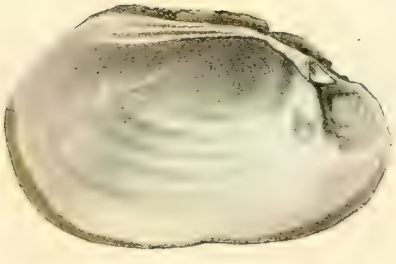


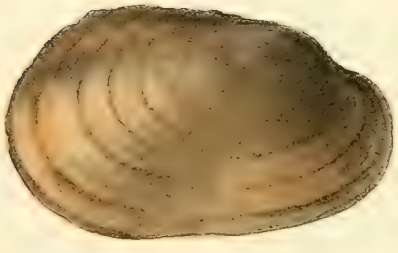
Fig 354

Fig 353.

Lith of Endicott.







PLATES

OF THE

CRUSTACEA.

Plate 1.

Fig 1

Lith of Endicott New

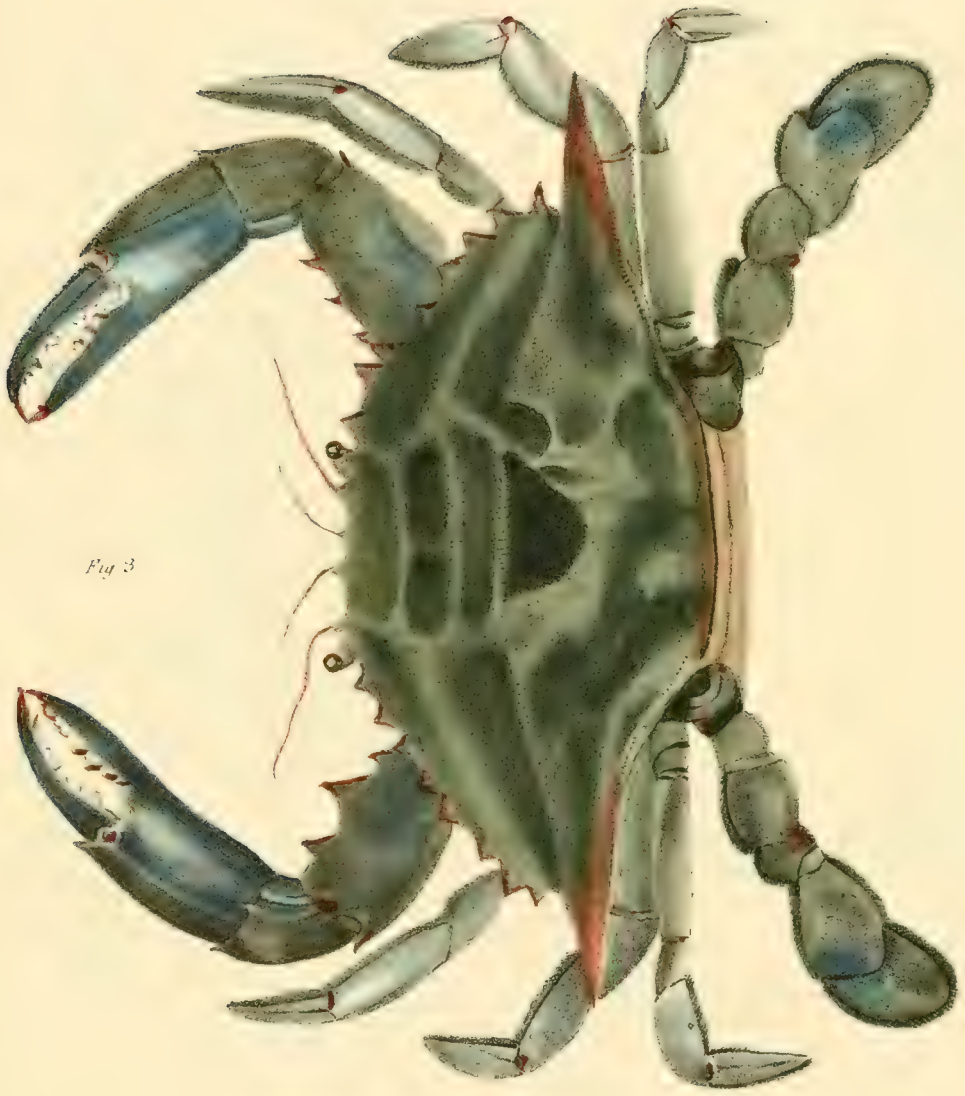


Fig 3

Lith. of Endicott New York

Fig 4

lith of Endicott New York

Lith. of Endicott New York.

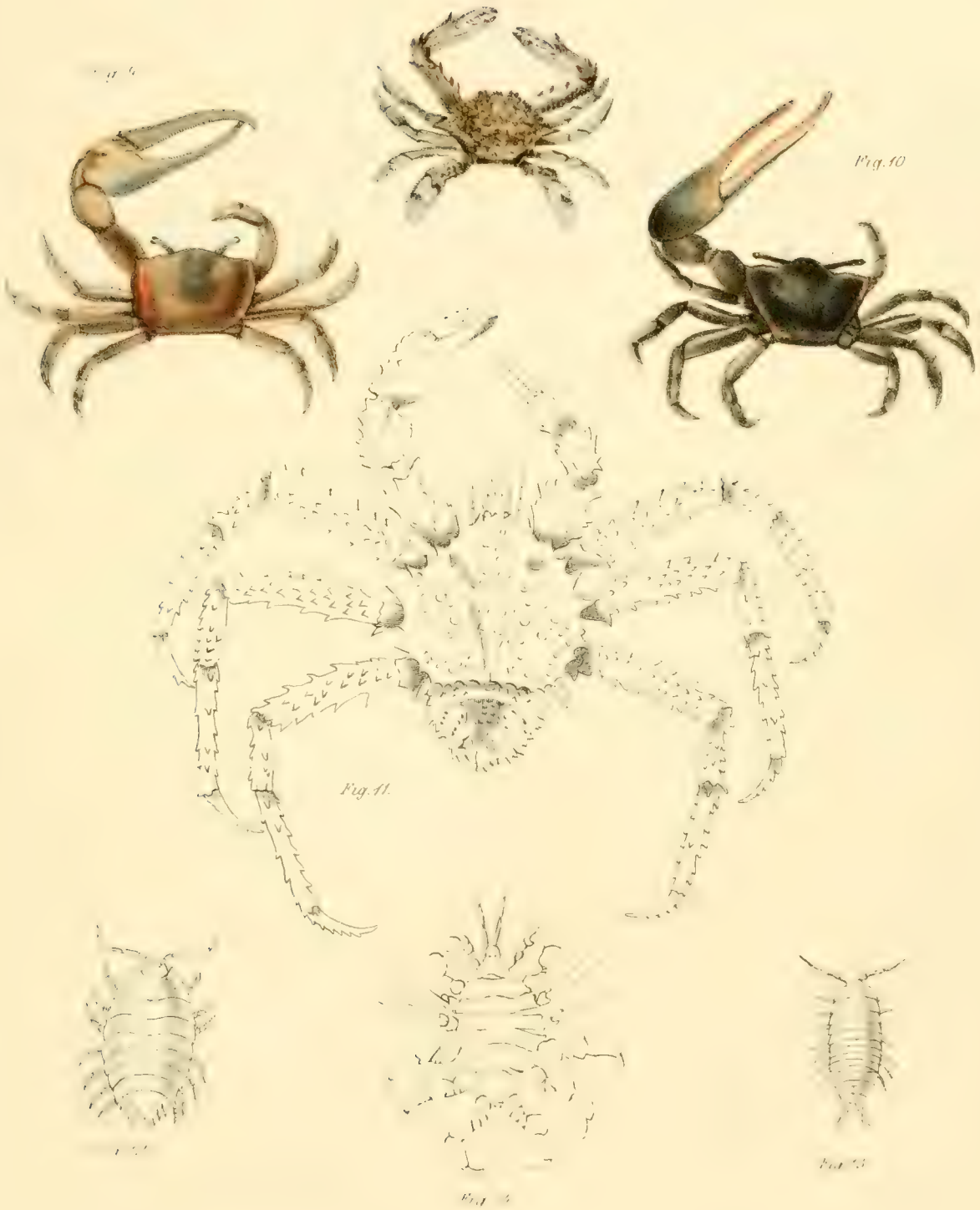


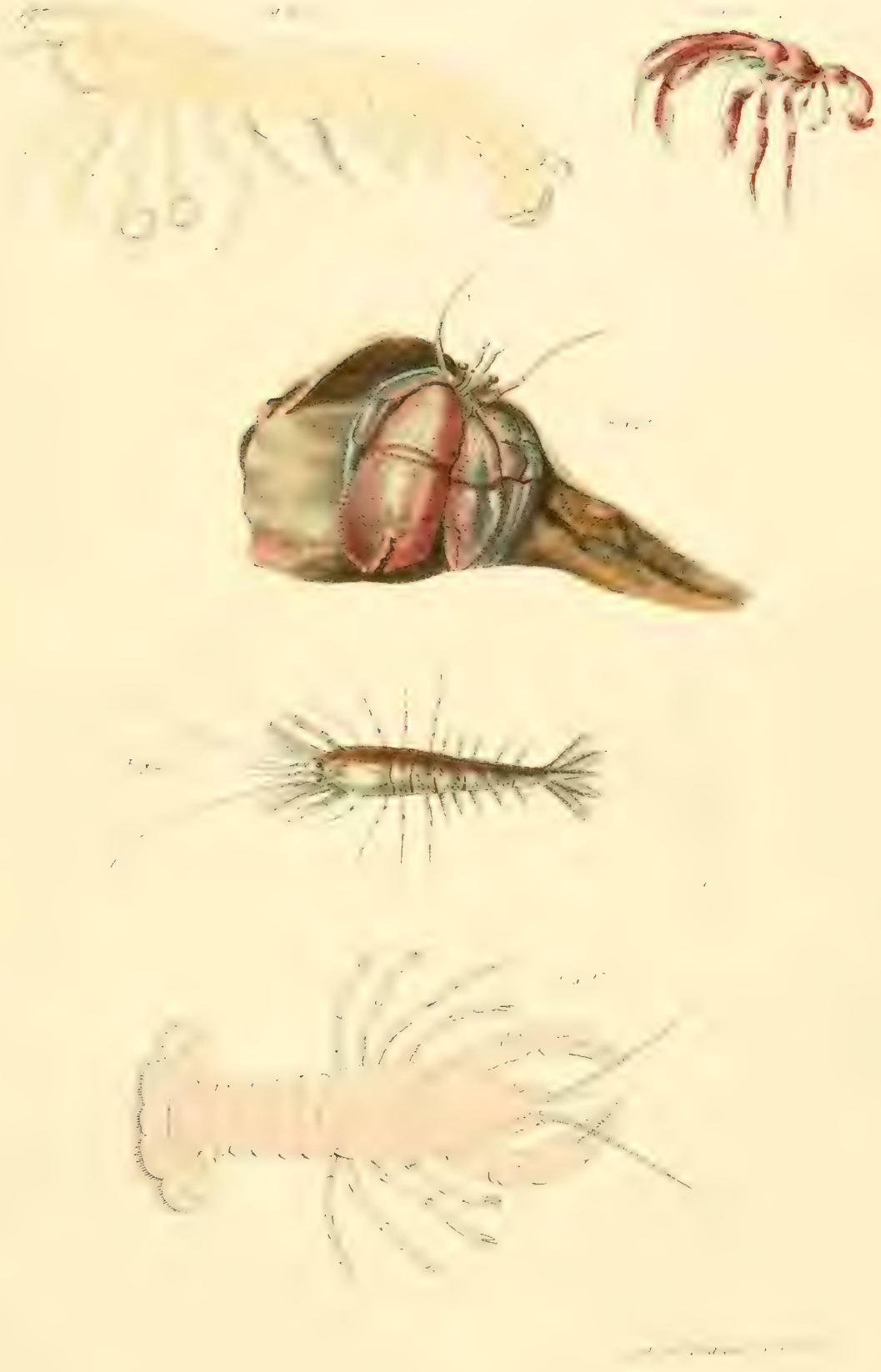
Fig. 10

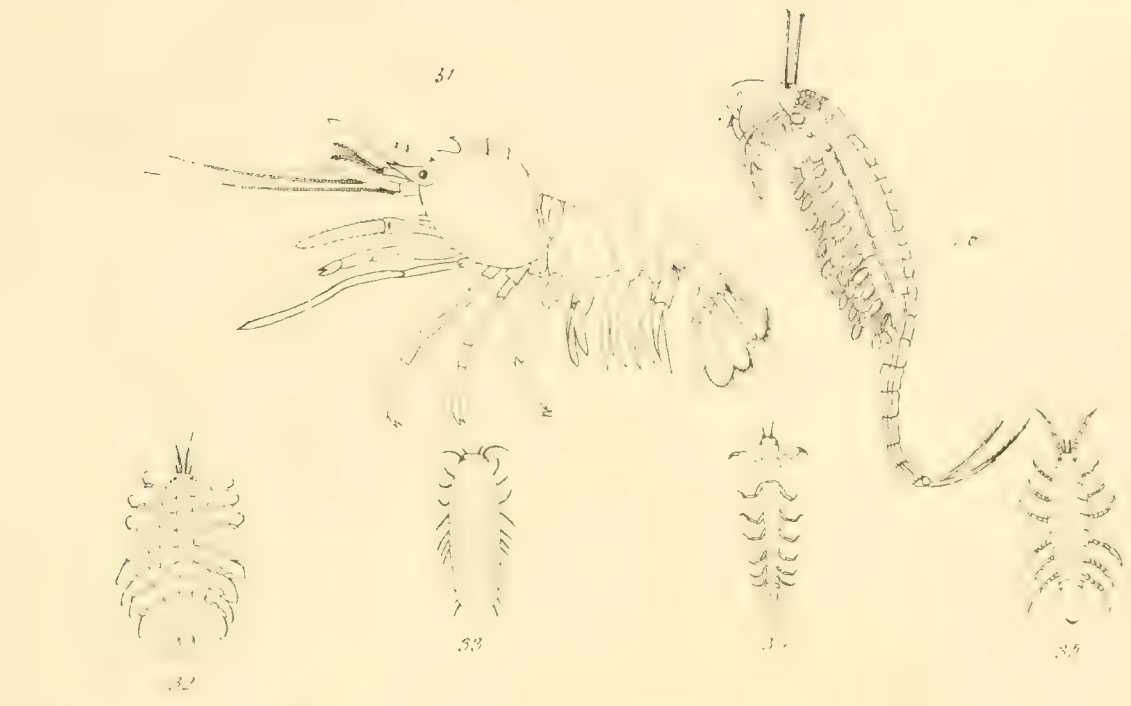
Fig. 11.

Lith of Endicott New York

Plate 7.

Lith. of Endicott, New York.





Tilt. & Endicott New York

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Fig 50

51

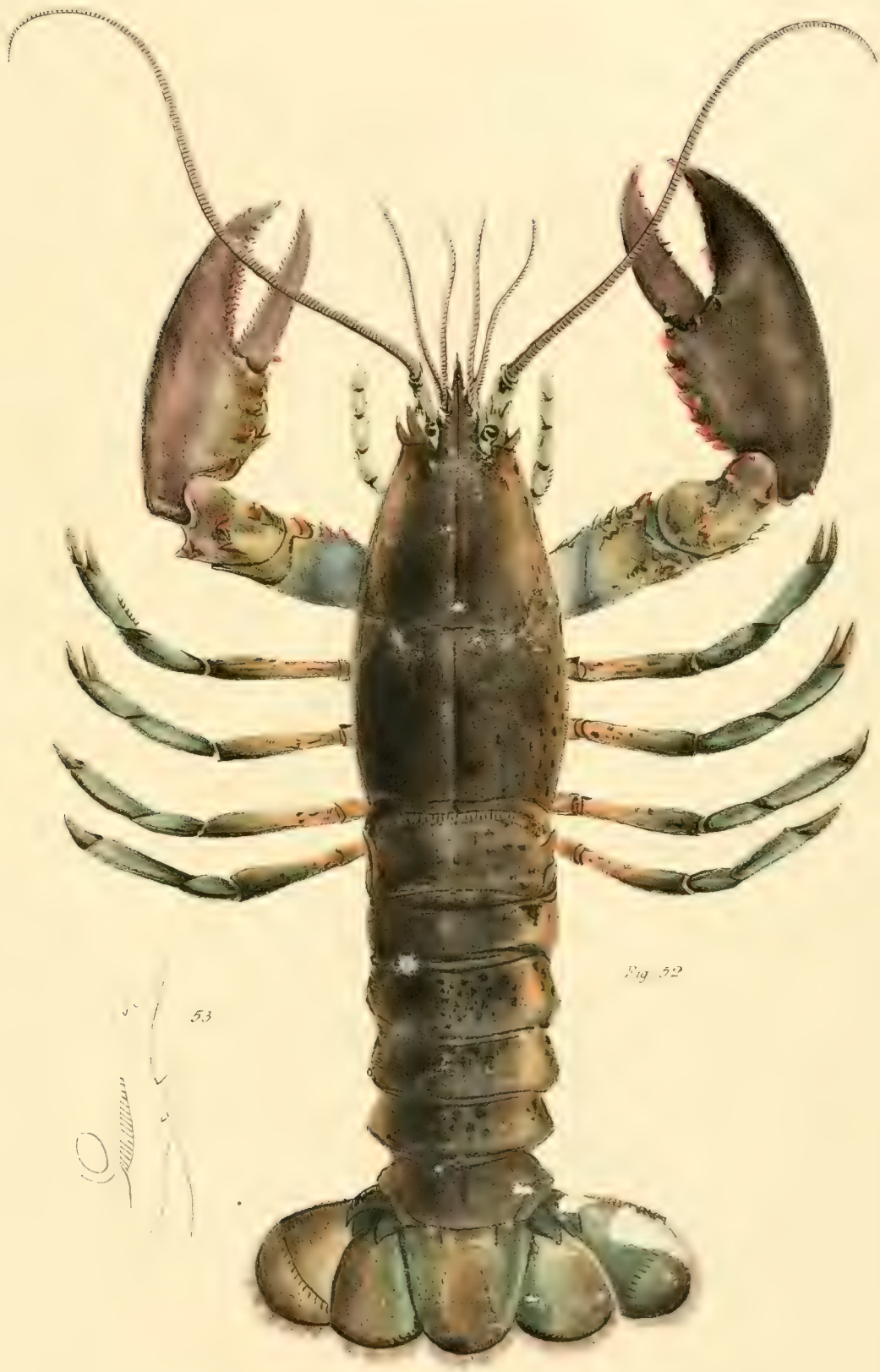

Fig. 52

53

Pub. of Endicott New York

Plate 13.

Lith. of Endicott, New York.

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